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DOMESTIC ENGINEERING

The Plumbing and Heating Weekly

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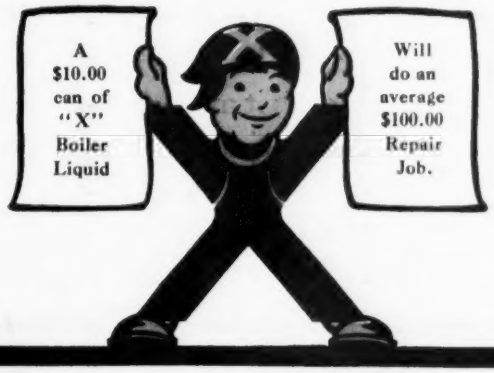


"I'll show you quick profits"

I'M "X". My job is to make friends and profits for you! Here's how. Ordinarily a cracked, leaking boiler means your customer must suffer without heat for several days or weeks, big expense and time wasted.

But not when you put "X" on the job! No Siree! I fix the leak quickly with no long shut-down and what's more I seal the boiler so that it's permanently drum tight. That's where your big profits come in! The whole job takes so little of your time—the boiler can be used at once—your customer is *your* customer for life — and your bill is paid promptly.

My boss sells over three million cans of "X" every year.

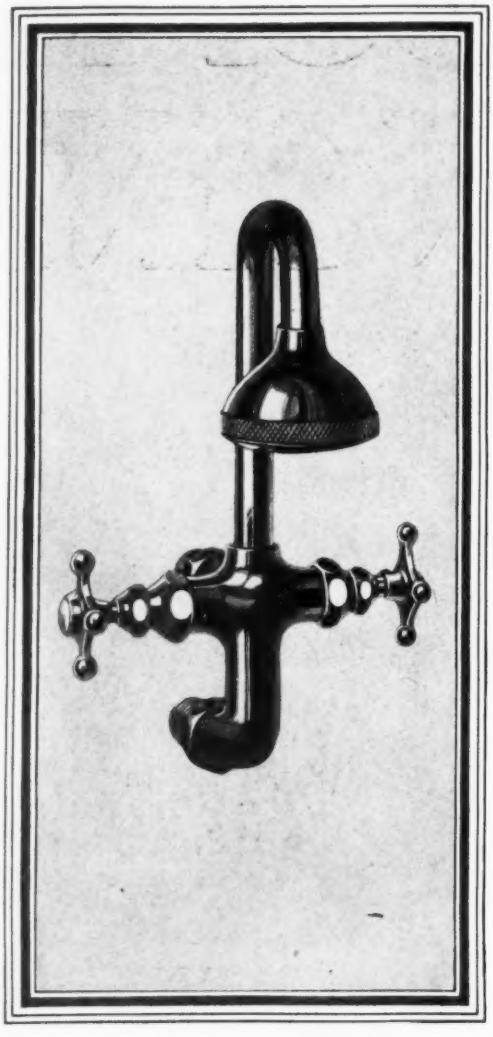
Always keep "X" Boiler Liquid in stock—it's your friend in need!

"X" LABORATORIES New York City

"X" Boiler Liquid

A Trade Getter Among Industrials

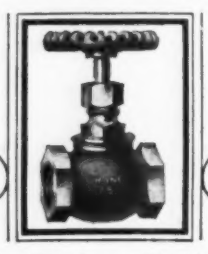
The "Telsa" mixing faucet, illustrated here, provides a serviceable washroom fixture for industrial installations. It is convenient to use and meets the latest requirements of factory sanitation. The large cast brass spray makes it more convenient to wash in running water. It is constructed of enduring red metal and equipped with swivel discs and renewable seats to withstand severe service. A wide variety in Crane brass fixtures of similar advanced design provides equipment of Crane quality to satisfy every requirement.



CRANE

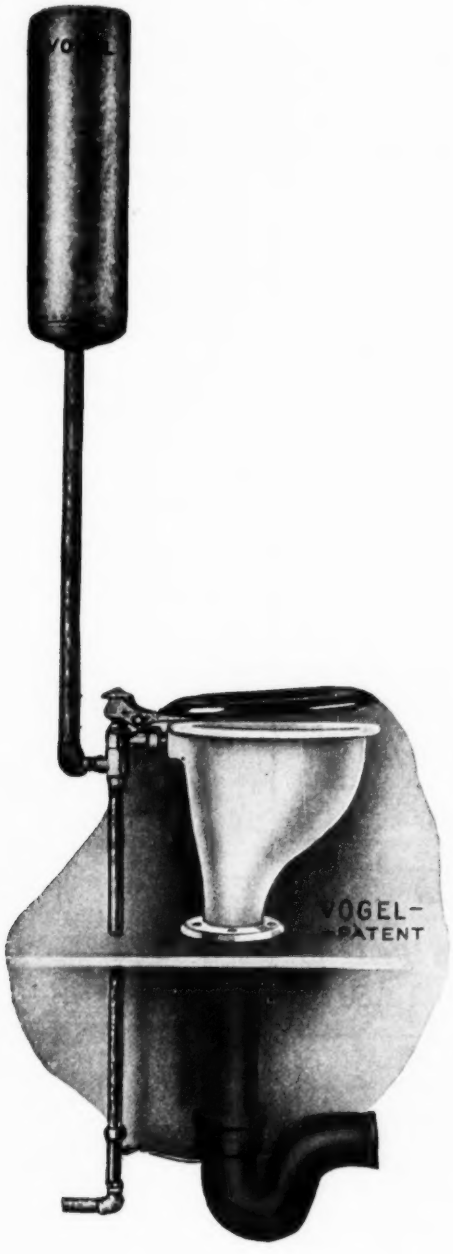
GENERAL OFFICES: CRANE BUILDING, 836 S. MICHIGAN AVE., CHICAGO

Branches and Sales Offices in One Hundred and Thirty-five Cities
National Exhibit Rooms: Chicago, New York, Atlantic City
Works: Chicago and Bridgeport



Crane 75 Low Pressure Globe Valve

MEMBERS
THE NATIONAL
TRADE EXTENSION BUREAU
OF THE
PLUMBING AND HEATING INDUSTRY.
PERMIT NO. 99 REGISTERED.



Christmas Shopping

Most every one is or is thinking it's time to be starting. The nip in the air and the changing winds at Christmas shopping time are gentle reminders that golden, mellow Indian Summer has really gone and cold blustry Winter will soon be with us.

Time was when the thoughts of freezing weather brought fear of frozen water closets in unheated places, but that was before the VOGEL Line was made.

The VOGEL closet can be installed in zero weather almost as easily as in summer, as no pit is required and it will never freeze. For installations in out-houses, garages, and other unprotected places it is the ideal equipment.

Your jobber will tell you all about it.

Jovo—

Jos. A. Vogel Co.

Wilmington, Del. St. Louis, Mo.

VOGEL
PATENTED

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Zwermann Co. 406

$78 profit from one radiator valve

IT SOUNDS impossible to make that much profit from such a small article—but it isn't, for that is exactly what a radiator valve brought to one Heating Contractor.

One of his customers who was building a new home had specified old-fashioned stuffing box radiator valves on all his radiators. But this contractor put an IDEAL PACKLESS VALVE on one of the radiators instead.

That valve never leaked—but the others did. That valve turned easily while the others stuck.

And the customer was so enthusiastic over the performance of this one valve that he not only equipped all his radiators with IDEAL PACKLESS VALVES, but he persuaded two of his friends, who were building new homes, to do the same thing.

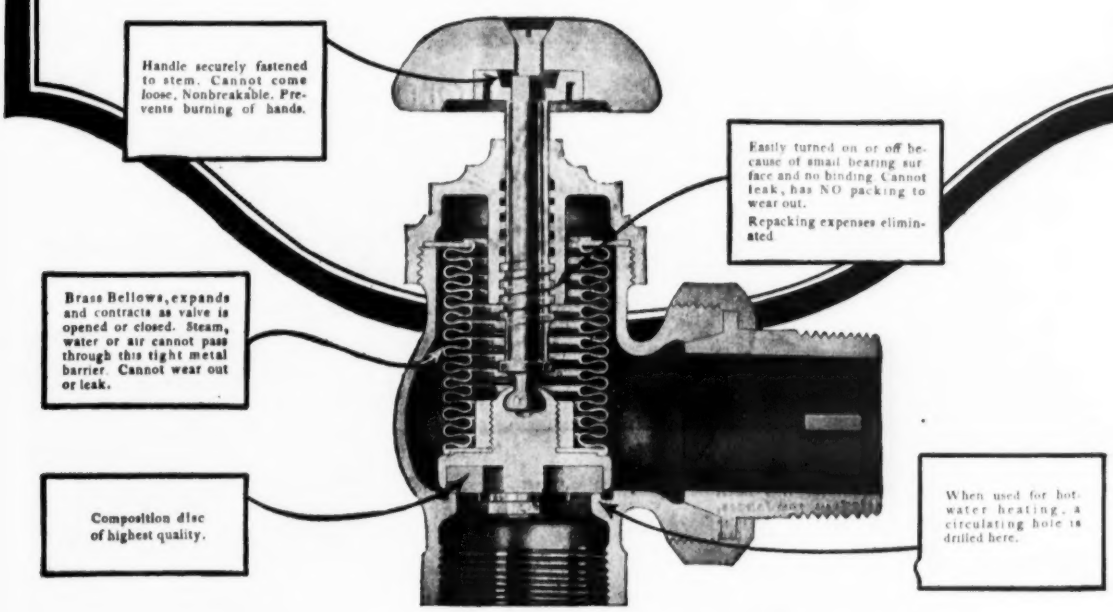
The total profit on these three jobs was $78.

We want you to have the same opportunity that this Contractor had. So we are glad to let you have just one IDEAL PACKLESS at a very reduced rate.

This sample valve will prove to you that it will increase your profits. It will pay for itself several times over on the first job you change, and it will continue to pay dividends for years.

And it will prove to the owner that the first cost is the only cost.

You can get your sample valve from our nearest Branch.


Handle securely fastened to stem. Cannot come loose. Nonbreakable. Prevents burning of hands.
Easily turned on or off because of small bearing surface and no binding. Cannot leak, has NO packing to wear out.
Repacking expenses eliminated.
Brass Bellows, expands and contracts as valve is opened or closed. Steam, water or air cannot pass through this tight metal barrier. Cannot wear out or leak.
Composition disc of highest quality.
When used for hot water heating, a circulating hole is drilled here.

IDEAL PACKLESS VALVE

AMERICAN RADIATOR COMPANY

IDEAL Boilers and AMERICAN Radiators for every heating need

1807 Elmwood Avenue Dept. P-101 Buffalo, N.Y.

When you are installing a Mixing Valve shower you might just as well give your customer the benefit of one with the Anyforce Head; then he can also control the water's volume.

The Anyforce Head is included without specification on all the more popular types of Speakman Mixometer Showers—H-952½, H-954½, H-895 and similar types.

A folder entitled "Anyforce" will tell you anything more that you want to know about this head, but really the illustration tells the whole story: A turn of the china lever handle gives any shower volume or force no matter what the water pressure is or whether the shower is on the top or bottom floor of a building, in a valley or on top of a hill.

Tell us to send this folder, and if you can use some for your customers mention that also.

The Mixometer has been time-tested in residences, hotels, clubs and institutions for more than ten years —

It always works.

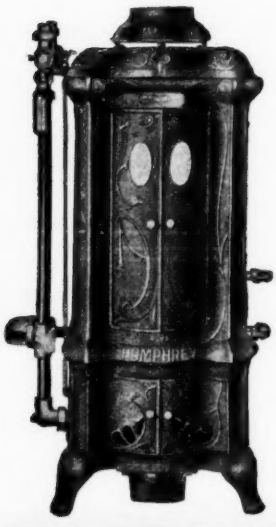
SPEAKMAN COMPANY, Wilmington, Delaware

SPEAKMAN SHOWERS

No Nurse Needed

Humphrey Automatic Gas Water Heaters get along fine without nursing. They stand on their own feet and look out for themselves. They're *workers*, not *invalids*.

Too much of this nursing business—"servicing" as they call it—is bad for profits. And a trouble-maker, too. That's why a Humphrey sale is worth while. The profit *sticks*.



For three years now, with heater sales steadily increasing, our sale of parts has been just as steadily falling off—17% one year, 10% the next. And the same way with service costs at branches.

That's interesting and there's only one explanation for it. Humphrey Heaters have always given longer continuous service than any others—and now they're breaking their own records.

If you don't care to waste good time and money on "cripples," install Humphrey Heaters, pocket the profits and move on to new sales. We work right along with you.

HUMPHREY COMPANY

(Div. Ruud Mfg. Co.)

Kalamazoo, Michigan

Metal and Valves

With a little training anyone can throw metal into a furnace and melt it for the molder—but it takes an organization with knowledge and experience to supervise properly every step and turn out an ever-uniform product.

The O-B Foundry is run by metallurgists who know the work. Their labor is fully justified by the results.

YOUR JOBBER CAN SUPPLY YOU WITH O-B VALVES

The Ohio B Brass Co.
Mansfield, Ohio, U.S.A.

NEW YORK, 50 Church Street PHILADELPHIA, 710 Witherspoon Bldg. CHICAGO, 343 So. Dearborn Street
WM. P. HORN CO., Pacific Coast Agents San Francisco Portland Seattle Los Angeles

The B&B Line—World's Most Complete Line of Heating Specialties

VACU TRAPS · MULTIFLEX TRAPS · MULTIFLEX VALVES · DAMPER REGULATORS · VENT VALVES · BLAST TRAPS · VACU-STATS · REDUCING VALVES · THERMOSTATS · PNEUMATIC VALVES

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of
The Bishop & Babcock Co.

Amsterdam, N. Y.
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I. Hardeman Co.

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E. Vernon Hill Co.
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C. R. Lingo Eng'g. Sales Co.
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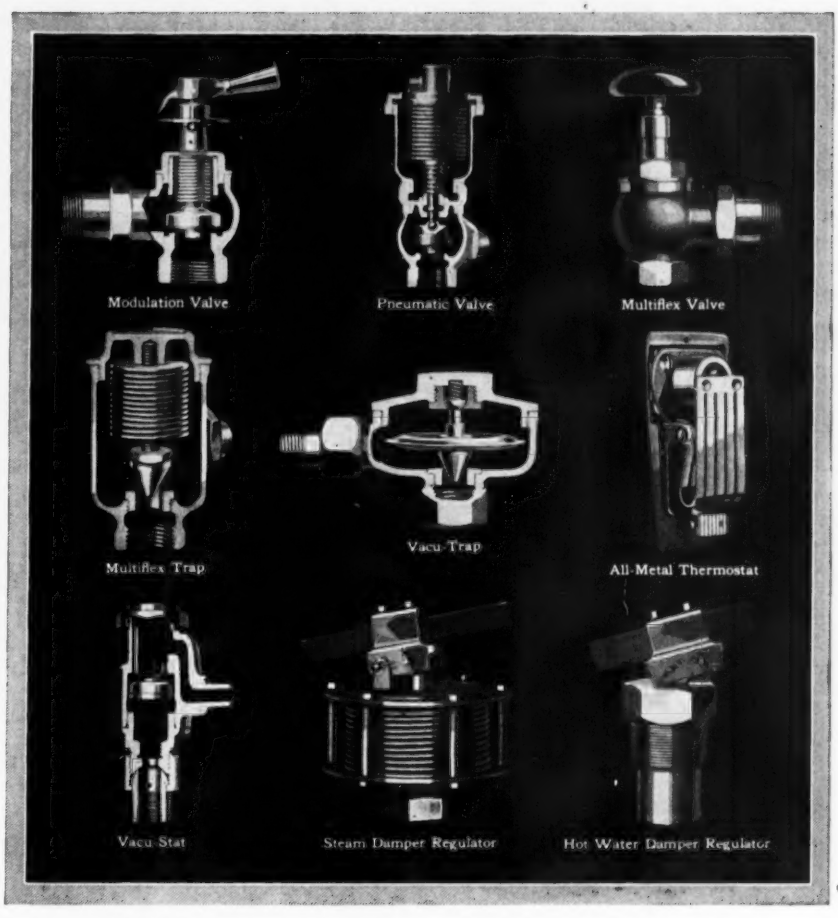


Investigate the B & B Line of Heating Specialties and the B & B Temperature Control System

IMPRESSIVE structures such as the Pennsylvania Hotel in New York and the General Motors Building in Detroit, and a multitude of lesser buildings, apartments and dwellings, are equipped with B. & B. Heating Specialties.

Does not this suggest that behind the B. & B. Line there are technical experience, manufacturing resources and service facilities that may be of value to you?

When you are planning or figuring heating installations, we suggest you get in touch with one of the 23 B. & B. Service and Sales Offices listed in the left hand column.

You will find this contact both informative and profitable.

It will enable us to explain the merits of the B. & B. Specialties and the B. & B. Temperature Control System, and particularly to point out the advantages of the B. & B. Service-Plan of personal co-operation.

7 BULLETINS have been prepared, illustrating and describing the specialties shown above. Illustrated bulletins are also available on the B. & B. Air Line System of Steam Circulation and the B. & B. Temperature Control System. For printed literature please write the nearest B. & B. office or the general offices, Cleveland, Ohio.

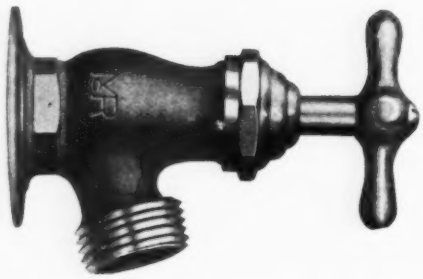
THE BISHOP and BABCOCK CO.

GENERAL OFFICE AND FACTORIES: CLEVELAND, OHIO

Standard

IF the brass goods included in your plumbing jobs do not stand up in service, the installation, as a whole, will not be satisfactory.

For the past thirty-three years our line of brass products has lived up to a high standard of service, efficiency and durability.



The trade mark shown above appears on our products for your protection. Look for it.

Ask your jobber

The McRae & Roberts Co.

CAMPBELL AVENUE AND WABASH RY. DETROIT

Manufacturers of Valves, Bibbs, Stop and Wastes, Pipe Fittings, Air Cocks, Water Gauges

Something New!

NOVA *Double Sink Fixture*

A New Haysco Line

Convenience is the biggest word in the home owner's vocabulary—buildings everywhere are being made more convenient and the fixture that satisfies this demand is the one that you can use and get your money for.

Our Nova Double Sink Fixture meets this demand for convenience. Has one outlet—a faucet that swings from left to right as the user desires. Runs both hot and cold water. The pipe connections are not solid but will permit adjustment within a range of at least one inch. Has special soap dish that saves soap and is surprisingly convenient. Can be furnished with or without this soap dish.

Made of high grade heavy materials; valves seat perfectly and the threading is heavy and absolutely accurate so that you can be sure that your customer will be more than satisfied with this combination sink feature.

Nova Double Sink Feature, like the Haysco Compression Stop and Waste Cock and other Haysco products, is made for the plumber who feels his responsibility to his customers—who knows the kind of job that should be done and the kind of fixtures that his customer should have—and insists on giving that kind of service.

We are not only making this kind of brass goods for this kind of a plumber but we are co-operating with him in a very practical way in his efforts to sell his kind of service. Read the paragraph to the left and send for the booklet describing this new service. Haysco products are sold only through jobbers.

FREE!

Haysco has a new kind of service for plumbers. It is fully described in our booklet—"Better Business for Plumbers." Send for it. The booklet is free and so is the service. Write for it today.

THE HAYS MFG. CO. Erie, Pa.

Manufacturers of a complete line of ground key and compression products. More than a half century of making dependable products.

THE M. S. Little MANUFACTURING COMPANY HARTFORD

THE A. J. Beaton Manufacturing Company of New Britain, Connecticut, has recently been purchased by us and moved into our own plant in Hartford, where we shall continue to manufacture their line of plumbing and heating goods.

In our future production of their line, including floor and ceiling plates, automatic and key air valves, etc., it is our purpose to set up the same high standard of quality which we maintain in the manufacture of our own line of tubular brass plumbing goods.

The Bemanco automatic air valves differ in design from any other valves. The base is patented. It entirely eliminates water pockets. The thermo expansible member exactly fits the bottom of this patented base and will not split when the adjusting screw is regulated.

The M. S. Little Manufacturing Co.

Hartford, Connecticut, U. S. A.

GET GRABLER'S COSTALOG — IT'S FREE

THE GRABLER
Manufacturing Co.
CLEVELAND, OHIO

Grabler's Costalog is a handy little booklet that tells instantly sizes, weights and costs of fittings so that you can sit at your desk, or out on the job and figure in a jiffy the exact cost of any job. Eliminates guessing, makes you absolutely sure—and safe.

Grabler's Costalog is being used by thousands of plumbers all over the country. Every day we receive a large number of requests for it. Every one is sent absolutely free whether you are now using Square "Gee" fittings or not.

However, if you have never used Square "Gee" fittings order a small stock from your jobber and give them a trial. We have developed special tapping machines and finishing processes; extraordinary smooth countersinking and a thorough system of inspection.

You can be sure that every time you grab a Square "Gee" out of the keg or bin, it will start easy and straight and will come tight the first try. This is why we are particular to see that every one of our fittings has our square G stamped on it. We are proud of our fittings and want you to know that they are ours.

Square "Gee" fittings are carried by plumbing supply houses everywhere. Ask your jobber's salesman for Square "Gee." In the meantime write to us for your copy of Grabler's Costalog. It's free.

SQUARE "GEE" FITTINGS
Malleable Iron Pipe

Would you tear out this page for $2.00?

Of course you would———

Just to make it worth your while to give a real test to

BOILER SEALTITE

that will repair a leaky or cracked heating boiler in a few minutes, and

SCALE SOLVENT

that will clean out a boiler that is clogged with scale and will remove oil and grease from new installations.

We will send you one $2.50 can of each ($5.00 actual value) for $3.00 (actual manufacturing cost); that puts $2.00 in your pocket and $50.00 in your business.

HERE IT IS—FILL IT OUT!

BOILER SEALTITE CO.,
239 E. 63rd St., Chicago, Ill.

Send me the $5.00 worth of "Boiler Sealtite" and "Scale Solvent" for the $3.00 which I enclose.

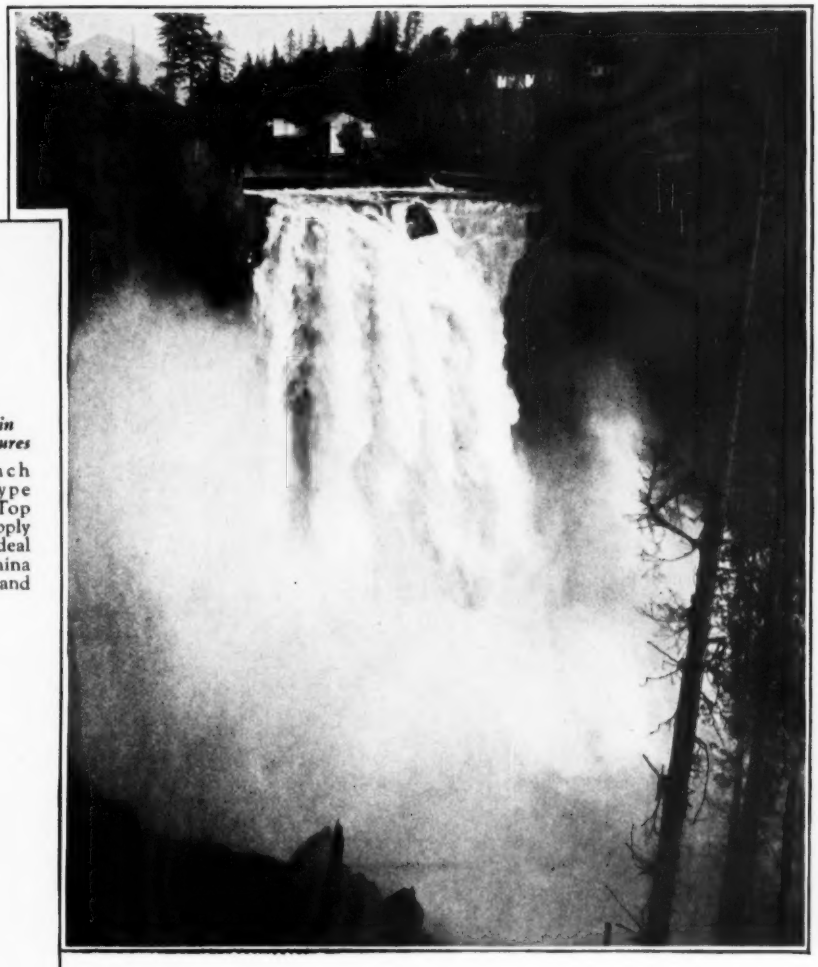
Name .....

Address .....

Jobbers Name .....

" *Address* .....

The steady erosive action of water under pressure in pipes is less spectacular but more intensive than that which has worn this chasm in the solid rock —at Snoqualmie Falls, Washington— height 270 feet.
Photo Courtesy Burlington Route



Wolff Quality in Bath Supply Fixtures

G-1308—½-inch Concealed Type Compression Top Spout Bath Supply Fixture and Ideal Waste with China Cross Handles and Flanges.

G-1310—½-inch Concealed Type Compression Top Spout over Rim Bath Supply Fixture and Ideal Waste, China Handles and Flanges.

WOLFF MANUFACTURING CORP. CHICAGO TRADE MARK

Waterwear—Neutralized

Experience has shown every master plumber the hidden hazards of water confined under pressure in walled-in pipes and fittings built to a price.

Wolff Quality Plumbing takes no chances with the physical, chemical and electrolytic reactions it must withstand. In the construction of Wolff brass goods and fixtures, sturdy castings of special metal are used instead of sheet brass and galvanized metal; the design and analysis of every part is specified and tested to insure lasting, uninterrupted and trouble-free service.

Leadership has come naturally and conclusively through the enforcement of this manufacturing policy throughout two-thirds of a century. Today architects, contractors and master plumbers unhesitatingly specify Wolff Quality where service requirements are most severe.

WOLFF

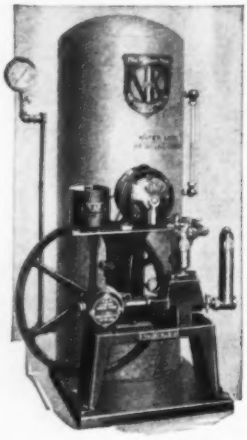
Makers of Quality Plumbing Since 1855

Sanitary Enamelware Brass Goods Potteryware Range Boilers Marble

Branch or Distributor at Every Central Point

The presence of Wolff Quality Plumbing in a structure implies quality construction throughout.

When Recommending Water Systems to Your Customers
the Following Points Should Be Considered



QUALITY

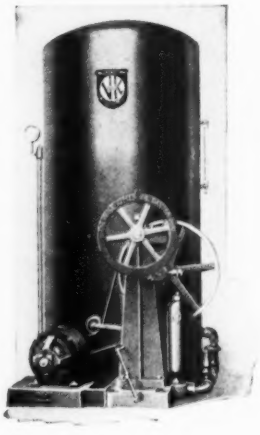
SERVICE

PROFIT

PROTECTION

PRICE

DELIVERY



Quality—

"V & K" systems are without a question, a quality product. By reasons of their many patented exclusive features and sturdy construction, they have rightfully gained the reputation of being THE quality water system on the market.

Service—

Because of their superior quality "V & K" pumps render the most efficient service.

Profit—

We have a very attractive and profitable proposition for the plumbing dealer who handles "V & K" water systems. This proposition is worthy of your investigation.

Protection—

Our sales policy gives you full protection. "V & K" systems are sold exclusively thru plumbing channels.

Price—

"V & K" prices have been reduced to where they are within the reach of everyone.

Delivery—

We can make immediate delivery on any "V & K" equipment.

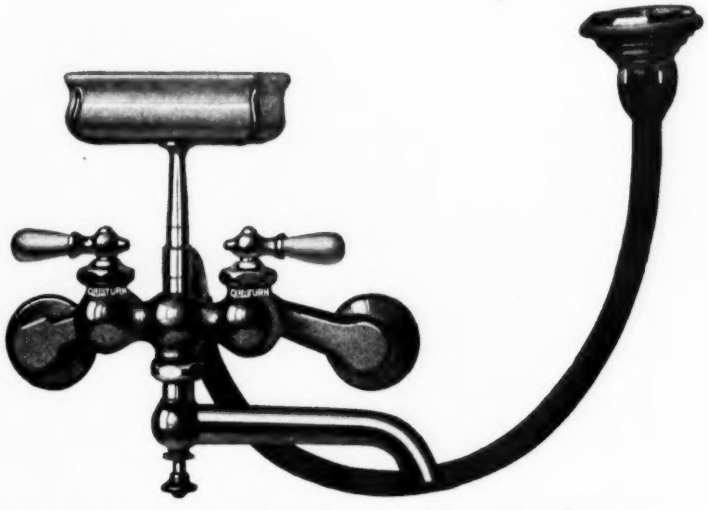
Write Us For More Detailed Information.

The Greatest Exclusive Manufacturers of Domestic Water Supply Systems in the World—250,000 in Use.

THE VAILE-KIMES COMPANY

DAYTON, OHIO

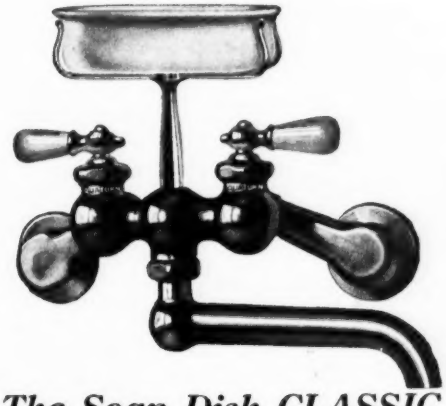
Classic-for-Christmas Campaign 1922



Three Styles

The Soap Dish CLASSIC with Spray

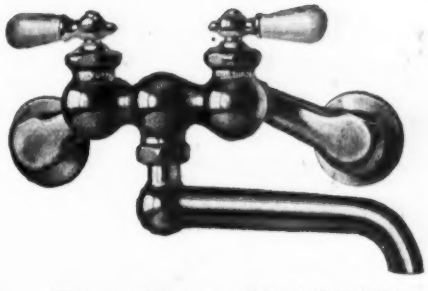
Adjustable Arms



One Quality

The Soap Dish CLASSIC

Anyone can afford to buy CLASSICS for presents, and you just —
Ask any woman if she wants one



From the standpoint of appearance alone, is it any wonder that your customers choose *CLASSICS?*

The Plain CLASSIC

THE CHICAGO FAUCET CO.

2712 North Crawford Avenue
CHICAGO

Women Now Insist That Kitchen Sinks Be Set 36 Inches High
Women give unusual attention to "Standard" Sink displays in Plumbing Dealers' and "Standard" Showrooms.
The invariable inquiry "Are these the 36-Inch High Sinks?" is evidence that "Standard" advertising has struck a responsive chord in home planning.
Fitted with the Swinging Spout Faucet "Standard" Sinks have, to an exceptional degree, the quality of making and holding customers.
"Standard" "S" traps have tubes of adequate length for sinks set 36 inches high. All "Standard" traps have extra heavy cast brass body.
"Standard"
PLUMBING FIXTURES
Standard Sanitary Mfg. Co.
Pittsburgh
Sinks are Now Set 36 Inches High

PERFECTION
Automatic Air Valves

A line that has stood the test of time

Wellby Special No. 5

Other Beaton & Cadwell Products

Floor and Ceiling Plates
Wood Wheel Air Valves
Key Valves
Key for Key Air Valves
Pipe Rolls
Pipe Hangers
Hook and Expansion Plates
Gauge Glasses
Escutcheons
Towel Bars
Radiator Foot Rails
Pipe Hooks
Floor Sleeves
Spud Wrenches

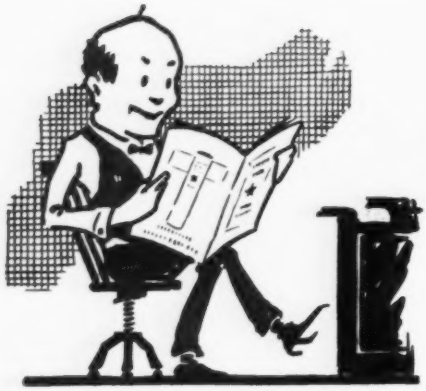
Complete Catalog Free on Request

THE Perfection line is a complete line—that's why it is a good one to standardize on. No matter what the class of building your jobs are on—residence, apartment, office, hotel or school—there's a Perfection Valve that will exactly fill the bill.

If it's competitive business where corners must be cut—there's a Perfection Valve that will help you save on material costs, yet will give good, honest, satisfactory service. If the requirements of the job make "the best" necessary, there's a Perfection Valve for that service, too. Every Perfection Valve, whether the best or the cheapest, is carefully tested before shipping.

Special Circular on Perfection Valves mailed free on request

THE BEATON & CADWELL MFG. CO.
Pioneers and Largest Plate Manufacturers in the Country
NEW BRITAIN ∴ CONNECTICUT
New York Office and Store 234 Water Street



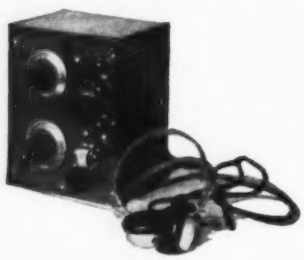
A Free Book on Sales Promotion

Written especially for Master Plumbers

We have employed a national merchandising and advertising agency, who for years have been familiar with and have written advertising for the plumbing trade, to map out a sales campaign for plumbers; the idea being to lay the foundation of a sales plan that will work and get business for large or small plumbers in large or small communities at a cost the plumber can afford to pay. The result is this new sixteen-page book "HOW TO GET MORE PLUMBING BUSINESS IN DULL SEASONS."

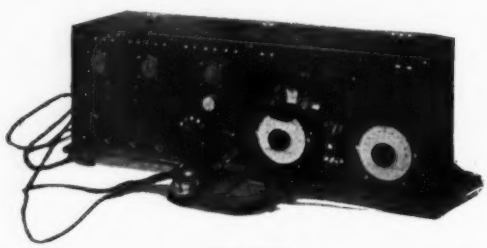
The plan offered is not intended as a means of getting business by cut-throat competition or by pulling it away from competitors. It is designed to cover the main elements that should be used in the selling and advertising of a retail plumber. It is also crammed full of suggestions that will help you in working out special plans of your own. It is a real idea-starter and is well worth being read thoroughly by every master plumber in the country.

It is free to the trade, so if you haven't already received your copy be sure to write for one.



Second Prize

This photograph shows the Clapp-Eastman set that will be given as a second prize. It is a fine set in every way. Its range is more limited than the first prize set but it still permits you to receive over a radius of many miles.



First Prize

This photograph shows the DeForest Radio Set that will be given as a first prize. It includes tuner, audion control and two stages of amplification, with which you can listen to practically any sending-station in the United States, yet it is so simple in operation that the amateur will have no difficulty in operating it. Both of these sets are so built that additional units can be added if desired.

These Handsome Radio Sets Will Be Given Away

To arouse more interest in the use of the suggestions made in the book—"HOW TO GET MORE PLUMBING BUSINESS IN DULL SEASONS"—we are putting on a prize-contest in connection with the distribution of the book—the prizes to go to the plumbers who develop the most business for themselves.

There will be no strings attached to determining the winners of the contest—they will be those who in the eyes of the judges have best fitted the suggestions made in with their own selling plans and have achieved the greatest success in so doing.

Small and large dealers will have an equal chance, as decisions will be based on intelligence used and percentage of improvement resulting.

The character of the judges, who are Mr. John S. Irvine, Mr. Guilford R. Adams, and Mr. William J. Woolley, is evidence enough of the fair spirit that will be back of this contest.

Do not fail to get a copy of this book now. You will always be glad that you did, for whether you go into the contest or not the ideas that this book will give you will repay you many times over for having sent for it and studied it.

In starting this contest and offering this plan, please believe that there has been no desire on our part to set ourselves up as an authority. We are simply firm believers in cooperative work. We know that if the manufacturers, jobbers, and plumbing dealers will all work hand-in-hand, all for one, and one for all, this big industry is going to go booming on through one prosperous year after another. The book on sales promotion and advertising is simply our contribution toward boosting the spirit of cooperation.

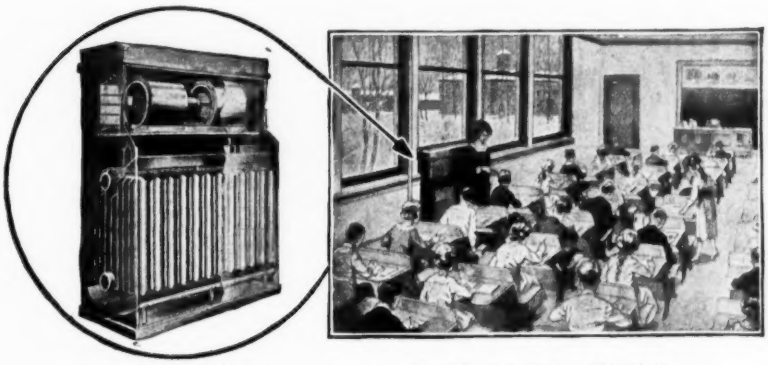
The book on sales and advertising—"How to Get More Plumbing Business in Dull Seasons"—is free to the trade. If you haven't a copy, send for one today. Just a notation on your letterhead is all that is necessary. The book will come to you by return mail postage paid.

Detroit Range Boiler and Steel Barrel Co., Detroit, Mich.

NEW YORK CHICAGO TRENTON TOLEDO ST. LOUIS SAN FRANCISCO

UNIVENT

"LIVE OUTDOORS-INDOORS"
(TRADE MARK)



Phantom view *Fresh heated air from the window*

Your Ideal of Ventilation Realized

Your ideal of perfect ventilation is all the fresh air you want, when you want it, where you want it.

Your ideal is realized perfectly in the Univent—because in principle it is as simple and more positive than opening a window—but without the cold and dangerous draft.

The Univent system is designed on a unit basis. Each separate room is heated and ventilated by its own individual Univent.

There are no uncleanable ducts or flues. Each Univent draws fresh air directly from outdoors, heats it and thoroughly diffuses it throughout the room.

Wind or weather makes no difference in the operation of the noiseless Univent system. It is positive.

Tests have proven that good ventilation in schools increases mental alertness of pupils and teachers 33⅓% and decreases sick leave 50%.

Univent installation cuts down building costs and saves space because no ducts or flues are necessary. For the same reason Univent air is purer than air travelling through long dust-laden ducts. The Univent is designed for schools and all buildings where mechanical ventilation is necessary.

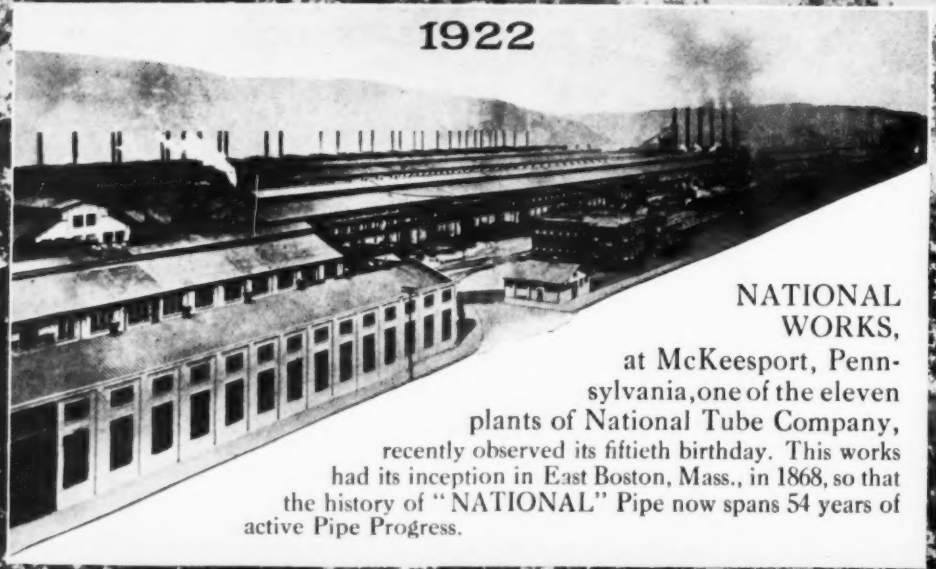
The Univent system is the simplest system to install. It is more profitable for the contractor. No adjustment of dampers (which never stay adjusted) are necessary, yet distribution of air is always perfect. There is a lot of business in store for you in specifying and equipping the old schools in your vicinity with the Univent system.

As a Heating-Ventilating Engineer *— you should know all about the Univent system. Send for a copy of our special 72-page Engineer's edition "Univent Ventilation." Please use your business letterhead*

THE HERMAN NELSON CORPORATION, Dept. D-1 *Moline,* Illinois

A Half Century

1922



NATIONAL WORKS, at McKeesport, Pennsylvania, one of the eleven plants of National Tube Company, recently observed its fiftieth birthday. This works had its inception in East Boston, Mass., in 1868, so that the history of "NATIONAL" Pipe now spans 54 years of active Pipe Progress.

TUBE WORKS MARKS 50 YEARS' EXISTENCE

Officials and Men Observe Anniversary of McKeesport Company.

VETERANS STILL ON JOB

Officials and veteran employes of the National Tube Company of McKeesport yesterday observed the fi-

Plant Observes Fiftieth Anniversary

On Sept. 13, 1872, the first pipe was turned out at the McKeesport, Pa., plant of the National Tube Co., and last Wednesday, the fiftieth anniversary of that event was observed by officials and veteran employes. Among the latter were two who were employed at the plant at its opening and who still are in active harness, Daniel Turley and Patrick Bligh.

The first product of the plant was 2-in. boiler tubes. Now the range of products includes all kinds of tubular goods, of sizes running from ⅛ in. to 30 in. in diameter. The original plant occupied only four acres and consisted of one small building. There are now scores of buildings, one of which is the largest mill under one roof in the world, while the plant as a whole is the largest [illegible]

National Tube Co. Fifty Years at McKeesport

Largest Pipe Mill in the World Has Had Interesting History Marked by Progressive Management and Successful Operation

National Tube Co., Pittsburgh, manufacturer of the universally known "National" pipe, celebrated on September 13 the fiftieth anniversary of the opening of its big McKeesport plant. Executives of the company, veteran employes and citizens of the city of McKeesport made the day a memorable one. It is the proud boast of the community that fifty years ago the largest pipe mill in the world was located there, and that today it can still make the same claim.

It must be remembered that the history of the company antedates its connection with McKeesport, for in 1869 John H. [illegible] Flagler

Pennsylvania, that the [illegible] of the company decided to seek a [illegible] port [illegible] be

September 21, 1922

National Tube Observes Fiftieth Anniversary

The fiftieth anniversary of the making of pipe by the National Tube Co., McKeesport, Pa., was celebrated Sept. 13 by officials of the company and its veteran employes. Men who helped to make the first pipe are living, and several of them [illegible]

"Great Oaks From Little Acorns Grow"

# of Pipe Progress

AFTER FIFTY YEARS existence—whether it is a man's personal life, a great political movement, a notable industry or invention, this seems a natural point at which to stand and look back over the accomplishments and failures of the half century, and to balance the realization of today against the struggles of the passing years.

From a modest beginning in 1872, with a small plant and a few acres of ground, the history of National Works of National Tube Company has been one of continual progress, until today it stands unrivaled in its position of leadership among plants manufacturing tubular goods. Keeping abreast of the times, keeping faith with the consumer, and with a desire to serve in an ever-increasing measure, is the keystone upon which the progress and growth of the plant has been made.

This anniversary has attracted editorial attention throughout the country, and as typical of such the following is quoted from the *Journal of Commerce*, Philadelphia, September 30, 1922.

"When one glances back over the pages of manufacturing and commercial pursuit during the past half century he will find much to interest him in the origin and inception of the leading concerns of the present day, for the onward and upward career of these enterprises in the majority of instances is merely the substantial fruit of success which usually comes to reward intelligent and energetic effort, no matter in what direction or in what capacity it may be applied.

Tracing the history of prominent and old established Pennsylvania enterprises it will be found that there is probably none which enjoys a wider prestige and reputation in its special line of activity than the National Works of National Tube Company located at McKeesport, Pa., which a few days ago had the pleasure and satisfaction of celebrating the 50th anniversary of its founding. It is one of the oldest concerns of the country and has developed to its present large proportions from a small beginning, but its growth and expansion have been consistent and gainful. The real secret of the continued success of the firm will be found in the fact that its management has always proven it is fully in touch with the progress and trend of the times, studiously striving to place upon the market a line of products that would sell themselves through the efforts of their own merits and qualities.

The people of McKeesport are naturally proud of the past record, present stability and future promise of the city's representative commercial and manufacturing enterprises; proud of that integrity of business dealing and consistency of energy of purpose which successfully meet the commercial rivalry and competition, because of known quality of product and reliability of service; proud of that up-to-date spirit of effort and endeavor which makes the success of the past the foundation upon which to build and plan for still greater achievements in the future, and in all of these essentials the National Tube Company is typical of that commercial energy and enterprise which won for the United States a position of leadership among the nations of the world."

The Pipe that for more than fifty years has been

The Recognized Standard of Wrought Pipe Quality

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

General Sales Offices: Frick Building.

DISTRICT SALES OFFICES

Atlanta Boston Chicago Denver Detroit New Orleans New York Salt Lake City Philadelphia Pittsburgh St. Louis St. Paul

PACIFIC COAST REPRESENTATIVES: U. S. Steel Products Company San Francisco Los Angeles Portland Seattle

EXPORT REPRESENTATIVES: U. S. Steel Products Company New York City

Dan Stillson's mark and what it means to *you*

The name "Stillson" is no longer a safe guide in buying a wrench.

If Dan Stillson could see some of the so-called Stillson Wrenches of today he wouldn't recognize his own invention.

The only *genuine* Stillson wrench is made by Walworth and has been ever since one day in 1871, when Dan was called into the office from the machine shop to demonstrate his first model to the Walworth directors.

Your safeguard in buying pipe-wrenches is the word "Stillson" stamped into the Walworth diamond trademark. It's the proof of the genuine and the guarantee of Walworth quality.

Made in all sizes, from 6 to 48 inches, with wood or steel handles.

Walworth Mfg. Co.

Boston New York Chicago
Philadelphia Seattle Kewanee, Ill.
Portland, Ore.

Boston, Mass.

Plants in Boston and Kewanee, Ill.
WALWORTH INTERNATIONAL CO.
NEW YORK, Foreign Representative

WALWORTH

Valves, Fittings, Tools for Steam, Water, Gas, Oil and Air

Many Profits from ONE Sale!

When you sell a Fairbanks-Morse Home Water Plant you not only collect the profit that goes with that sale, but in many instances also sell a large quantity of fixtures and plumbing equipment upon which you earn very satisfactory profits.

One dealer reports that his average sales of equipment with each water plant amount to $450. Other dealers report sales of from $300 to $500 worth of fixtures and equipment with each plant. In one case, $1,200 worth of equipment was sold at the same time as the water plant.

The Best Known Plant

Nationally advertised in publications reaching millions of homes, the simple, dependable, economical Fairbanks-Morse Plant probably is the best known—*easiest to sell*—home water system in America. The powerful advertising drive behind it, plus our effective direct mail assistance for dealers, has made this plant a money-maker for progressive dealers everywhere.

Know the whole story of this profit-getter. Send the coupon for complete details.

FAIRBANKS, MORSE & CO.
Manufacturers CHICAGO

With 200-Gallon per hour pump and 35-Gallon Galvanized Tank **$125** List F. O. B. Factory

With 400-Gallon per hour pump and 70-Gallon Galvanized Tank **$210** List F. O. B. Factory

It's Automatic

FAIRBANKS-MORSE HOME WATER PLANT

COUPON

FAIRBANKS, MORSE & CO.
Manufacturers,
900 South Wabash Avenue,
CHICAGO, ILLINOIS

Gentlemen: Please send, without obligation, full details of our dealer proposition on the Fairbanks-Morse Home Water Plant.

Firm Name .....

Town .....

State .....

164

The Heating Guide

Prompted by the many inquiries and orders received since the depletion of our stock of the first edition of

A Practical Manual of

Steam, Vapor and Hot Water Heating

we have published a second edition of this valuable treatise.

In addition to revising the first edition, the author has added three new and most important chapters on the construction, operation and installation of Vapor Vacuum Heating Systems, making it the first, and most complete manual on this type of heating ever issued to the trade.

The list of contents shown here gives an idea of the value of this book to the heating engineer and contractor, and to the steam-fitter.

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Price $3.00 postpaid

D O M E S T I C E N G I N E E R I N G
1900 Prairie Avenue — *Book Department* — Chicago, Illinois

Making Your Bank Book Smile

When you receive a check which represents a sum received for the sale of something which is no longer of use to you, you have completed the best kind of a deal; for you have turned ***nothing*** into ***something;*** you have made dollars blossom forth where none were before.

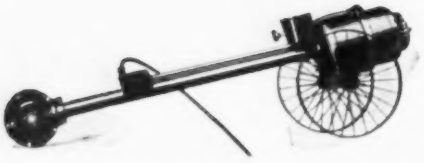
This unexpected money is happy money to your bank book. Every such entry you can make is a convincing testimonial to your administrative ability.

Look around now and see what you have for sale. Somebody wants it. There is always a market for Surplus Stock, Business Property, Serviceable Materials, Store Equipment, etc. Advertise it in the Classified Section of ***Domestic Engineering***. The cost is low—only 8 cents for each word including heading and address. Minimum $2.00. One inch $4.00. Cash must accompany order. Copy should reach us by Wednesday morning of week of publication. When key number is to be used, count seven words in addition to advertisement.

Write out your advertisement today. Describe what you have for sale. Do not be too brief for your description must be clear to the reader. At the most the cost of the advertisement will be an inconsequential fraction of the worth of the articles you have for sale.

Always read the classified advertisements

Page 408 this issue



"TOLEDO" POWER DRIVE—A PORTABLE POWER UNIT THAT INSTANTLY CONVERTS HAND TOOLS INTO MOST EFFICIENT POWER EQUIPMENT.

BIG BUILDING SERIES No. 5

"TOLEDO'S" WERE USED ON THIS NEW ELECTRIC PLANT

"Toledos" from the Power Drive to the pipe threaders and cutters were used by the electrical contractors on this new plant of the Cambridge Electric Light Co., at Cambridge, Mass. J. Livingston & Co., Inc., of New York, who were the contractors on this work, have eight "Toledo" Power Drives in use on various jobs throughout the country, and was the first concern to use a Drive to operate a winch and pull electrical cable through conduit, another use for the Drive which has become common practice among the large electrical contractors.

You will find as hundreds of contractors have, plumbing and heating as well as electrical, that a "Toledo" Power Drive in your equipment to operate your pipe threading and cutting tools will pay you immensely by the time and labor it will save.

Investigate this remarkable machine further. A postal will bring you full particulars.

THE "TOLEDO" TRADE-MARK IS YOUR GUARANTEE THAT YOU ARE GETTING "TOLEDO" QUALITY TOOLS.

THE TOLEDO PIPE THREADING MACHINE CO. Toledo, Ohio

New York Office, 50 Church Street

EDITORIAL
DOMESTIC ENGINEERING

Whole No. 1564 CHICAGO, DECEMBER 2, 1922 Vol. 101, No. 9

NEWSPAPER WILL HELP CONTRACTOR.

THE plumbing and heating contractor who has been convinced of the soundness of local newspaper advertising as a business builder, but hesitates to use it because he doesn't feel capable of preparing the copy, should not be deterred for a minute, for every progressive newspaper employs people trained to do this particular kind of work. In addition the contractor can get many helpful suggestions from his trade papers and the National Trade Extension Bureau. Advertising is an essential part of modern business, and the contractor cannot afford to neglect it if he would enjoy the greatest measure of success.

AN OPPORTUNITY FOR INCREASED SALES.

TO a great many plumbing and heating contractors Christmas has always meant a time when they went to other places of business and purchased presents, but did not sell any of their own goods with the expectation that they would be used for that purpose. They did not believe people would buy plumbing and heating goods for Christmas presents, and that is one of the biggest reasons why few did. However, with the spread of the merchandising idea among the plumbing and heating contractors the possibilities for increasing sales during the Christmas holiday season have become more apparent. In fact, quite a few contractors are cashing in on it.

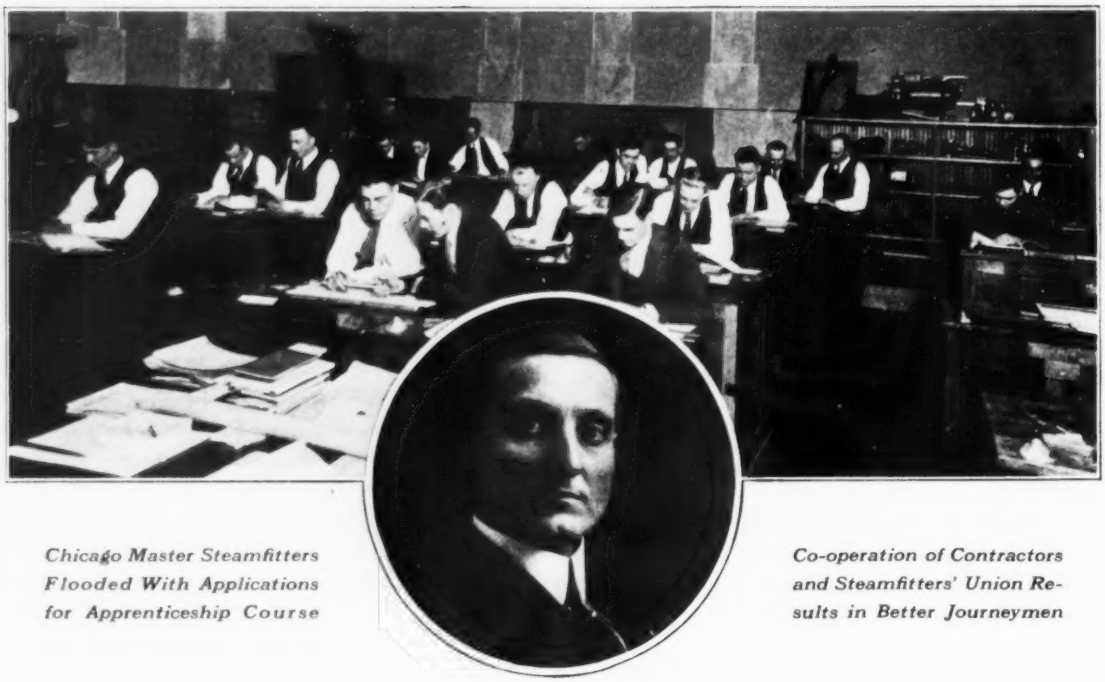
We may feel at times that the newspaper cartoonists and jokesmiths are rather crude and unfair individuals, but nevertheless they do accomplish some things worth while. Ridicule is a very effective weapon which often gets results where cold arguments make no impression. It has been quite effective in discouraging the great annual waste of money in useless, impractical gifts. Through ridicule the public has been taught to buy more sensible gifts, and certainly few gifts can be of as much value as modern plumbing and heating equipment to those who are without them. Any number of people in very moderate circumstances invest four or five hundred dollars in a piano, though no one in the family can or ever expects to be able to play it. At the same time the family does without modern sanitary and heating facilities, which are far more essential.

It is not to be expected that any young man will give his sweetheart a bathtub, that sister will buy brother a boiler, or that mother will give father a few lengths of pipe. But there are a great many homes where any one or more members might greatly increase the comfort and health of the whole family by providing a water heater, a shower, a new kitchen sink, laundry trays, a modern heating system to replace the stoves or wornout furnace, a heat regulator, attractive bath room accessories, combination cocks, or any number of other things handled by the plumbing and heating contractor which not only add comfort and attractiveness to the home, but also increase materially the actual value of the building. This, of course, is being done to some extent now, but it would be done on a much larger scale if the whole plumbing and heating industry was more thoroughly convinced of the soundness of the idea and its possibilities for increasing their business, and then through advertising, window displays, circular letters, and other means brought the idea forcefully before the public. Make Christmas a time of increased income as well as increased outgo.

COVER THE BOILER AND PIPING.

SOME heating installations that would otherwise be highly satisfactory do not function properly because the boiler or the piping is not covered. A building can not be heated on the same principle that an oven is, by applying heat on the bottom, top, and sides. The heat must be carried into the individual rooms and then released. If the boiler which generates the heat and the pipes which conduct it to the different rooms are uncovered, too much of the heat is wasted in the basement. A much stronger fire is also required which results in a greater loss up through the chimney. The cost of good asbestos covering is made up many times in the fuel economy effected and the increased satisfaction rendered. To the contractor it means getting the most out of a job, but still more important to him is the fact that he will have a thoroughly satisfied customer. There are a great many heating installations in this country yet not giving a full measure of satisfaction that could be greatly improved by a thorough job of covering. This presents to the plumbing and heating contractor an opportunity for rendering real service as well as for developing profitable business.

Solving a National Problem



Chicago Master Steamfitters Flooded With Applications for Apprenticeship Course

Co-operation of Contractors and Steamfitters' Union Results in Better Journeymen

From an Interview with George M. Getschow by H. E. Taylor

ANY discussion of the apprenticeship problem usually starts with words like these: "The trouble with the apprenticeship situation is this"—and then the speaker proceeds until a complete bomb-proof alibi has been established. But, in the meantime, there are no apprentices, the shortage grows more acute, while, in many cases, nothing is being done about it. No matter where you may go, that is the situation, generally speaking.

A welcome change it is, then, to talk with George M. Getschow, who, in speaking of the Chicago Steamfitters' Apprenticeship course, says: "We have what I believe to be one of the best schools in the country. We are receiving applications from young men anxious to learn the steamfitting trade faster than we can handle them, and, without a doubt, the system of training and education that we are following out will mean a higher grade of mechanics than has ever been known in the steamfitting business."

The problem of supplying the men who are to be the journeymen and masters of the future is, as Mr. Getschow recognizes, a national one, and one that may be handled in a national manner. As president of the Heating and Piping Contractors' National Association, he is working on plans that will begin to solve this difficulty in a national way. But, whatever suggestions are finally advanced to the national body, they will have to be broad in scope and liberal in construction to make allowances for the many local conditions that must be considered—conditions that may not even be known to the members of the apprenticeship committee of the National Association, or to others interested in more or better steam fitters.

The whole thing, then, appears to boil down to this: Every local must, to a large extent, devise its own ways and means of training and educating the boys, while the national associations and trade publications can aid by encouraging the work, and by contributing practical data on how it is being done elsewhere.

The popular and easy method of blaming it all on the journeyman is handed a decided jolt by Mr. Getschow when he says: "The union has been back of us to a man. The only reason we do not have the number of apprentices provided for in the agreement instead of two hundred, is that the contractors themselves are reluctant to assume the responsibility of taking the boys into the shop and providing them with the kind of training specified in the apprenticeship rules." And W. E. Hill, the very capable instructor in the theoretical work taught in connection with the course, adds: "There have been a number of the journeyman fitters out to visit the school, but

ONE of the best informed members of the heating industry on the question of apprenticeship is George M. Getschow, president of the Phillips-Getschow Co., of Chicago.

As president of the Heating and Piping Contractors' National Association, Mr. Getschow has helped to work out plans which, it is believed, will go far towards solving the apprenticeship problem in a national way.

Mr. Getschow has been prominent in heating and association work for many years, and his ideas and results are worth reading about.

the bosses don't get around quite as often as they should."

A fact that is brought out very forcibly is that the spirit of co-operation and a vision of their common interests have led the masters and journeymen to work together on this problem, so that, starting from zero, they have worked out the plans until the course has reached its present state of perfection.

Graduating Full Fledged Journeymen.

ALREADY about fifty men have graduated as full fledged steamfitters. Although the course is nominally five years in length, these graduates were men that had been helpers before, and who, upon returning from service in the army, were given the opportunity of finishing out their apprenticeship in as short time as possible. Masters and journeymen, who were present when the final examinations were given, expressed unqualified satisfaction at the way the first results of the work showed up.

The way in which the training is handled might well be considered in detail, for it is a plan that could, with possibly a few changes to suit local conditions, be used in most any part of the country.

The history of the Chicago project dates back a little over four years. It dates back to the fall of 1917, to be exact, when the shortage of journeymen, brought about by the "call to arms" and the lure of the munitions plants, caused the local contractors to sit up and take notice. The plan worked out at that time was inaugurated in 1918, and it is essentially the same now as it was then.

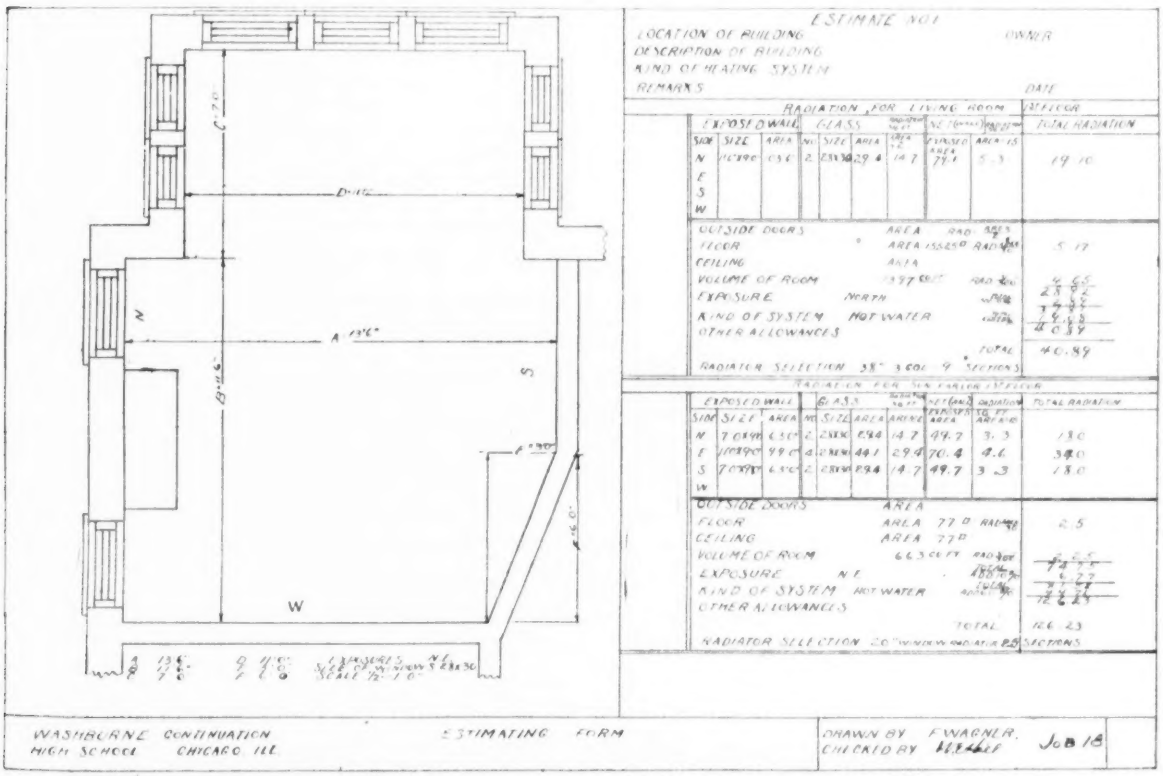
The handling of the whole apprenticeship matter in Chicago is vested in one body. And that body is the Joint Arbitration Board, composed of delegates from the Chicago Master Steam Fitters' Association and the Steamfitters' Protective Association. This board is the final authority on all matters in regard to individual apprentices or to the entire apprentice body. They examine all applicants, pass on their qualifications, place those accepted in the different shops, and, if the occasion arises, transfer them from one employer to another. As far as the individual apprentice is concerned, the joint board is lawmaker, policeman and judge.

There seems to be no lack of applicants who are anxious to learn the trade, as Mr. Getschow points out, despite the much talked about lure of the "white collar job." Consequently the board has opportunity to take only the highest grade of applicants. Only boys who have a fairly good education are selected. Most of them have finished grammar school and some have completed high school courses. Except in unusual cases, the applicant must be under 21 years of age and must weigh over 130 pounds. While steamfitters are not selected entirely by weight, it is plain to be seen that in a trade that involves much heavy work there is no use starting a man on the road to steamfitting who lacks the physique to go through.

After having passed his examinations satisfactorily, the candidate is placed in a shop on thirty days' probation. If, during this time, the employer is not satisfied with his work, or does not consider him a good investment, the board places him somewhere else. Once the employer has decided to keep a man, however, he is bound by the apprenticeship rules to retain him, except on written application to the Joint Arbitration Board, stating a desire and reasons for discharging him. It is customary for the board, in cases of this kind, to place a man elsewhere. And it has been pretty generally demonstrated that in this manner a place can be found where the apprentice gets along well, and both he and his employer are satisfied.

Rules and Regulations of the Course.

THE exact status of the apprentice is set forth in a set of twenty rules, drawn up by the Arbitration Board and gotten out in book form for the guidance of all apprentices, employers and journeymen.



Sample Estimate Form Completed by an Apprentice During His Third Month at the School.

Briefly, the twenty articles outline the following rules and regulations:

Employers and journeymen bind themselves to teach the apprentices the trade in a manner that will enable them to become efficient journeymen. All apprentices are under the direct control of the Arbitration Board. An employer may file a request with the board for a certain apprentice. All apprentices must attend the classes in theoretical work as provided by the board. The number of apprentices in any shop is limited to one to every three journeymen employed ten months or more out of the year. If over three apprentices are to be employed, a special dispensation must be made by the board. Apprentices are guaranteed at least ten months' work a year. They shall be paid at the rate of 45 cents an hour for the first year, with a five cent increase for each succeeding year. Each apprentice must pay into the union $50 a year for the five years. Thus the total of $250 pays his initiation fee into the union and entitles him to a journeyman's card, which is issued when he completes the course and passes his final examination.

Regarding the courses conducted at the school: The rules provide that the employer shall, if required, submit proof to the board that his apprentices have been attending to the studies, or lectures, or other work of this kind prescribed by the board. The requirements specify that the apprentice must attend at least eight lectures during the year, and in individual cases he may be required to attend school for mathematics or mechanical drawing. However, a much more comprehensive course of study has been adopted than the rules call for. And under the arrangement now in force every apprentice attends school one full day out of every two weeks, on his employer's time.

Upon the completion of the prescribed five years, he takes a final examination for a journeyman's card. This examination is given by the joint board and they may order the applicant back for a six months' longer time if they deem it necessary.

As a survey of the above rules will show, the Joint Arbitration Board is the supreme power as far as the apprentices are concerned, and the centralization of this power has been the keynote of the success of the school from the start.

The classes and lectures, as specified in the rules, have been developed and expanded until a complete course in the fundamentals of science and mathematics necessary to an intelligent understanding of the work of the steamfitter has been worked out.

How the Course Is Paid for.

THE classes are conducted in the Washburn Continuation School. The expense of conducting the classes is divided between the Board of Education, which furnishes the building and pays the instructor, and the Joint Arbitration Board, which has furnished most of the equipment because of the Board of Education's leisurely policy of doing things of this kind, although the latter is supposed to furnish the equipment also.

The classes and lectures are in the hands of W. E. Hill. Mr. Hill was for several years a power plant engineer, and he was formerly chief engineer in a large boiler manufacturing company. Under his able guidance a complete schedule of studies has been worked out covering the entire five years of the apprenticeship course. Mr. Hill recognizes the fact that before any instruction can be made to "sink in," as it were, an interest on the part of the pupil must be aroused. He has, therefore, devised a plan which ties up the theoretical work of the classroom with the problems of actual installation that are met every day. This "tie-up" has been brought about through drawing.

Mr. Hill has found that the average apprentice has a liking and, in many cases, a natural talent for the study of drawing. He capitalizes this to put across the whole educational program.

Drawing Is the Basis of Study.

MECHANICAL drawing leads up to isometric and perspective drawing, and from this it is just a step to plan reading, laying out heating systems, estimating materials from plans and figuring radiation. As these various problems of estimating and figuring develop, the mathematics necessary to carry them out are introduced. Thus a sometimes dry and uninteresting study is carried along on the enthusiasm for drawing and plan reading.

As the classes advance, elementary, and, later, more advanced instruction is given in the principles and application to every day work of hydrostatics, hydraulics, heat transmission, combustion, steam and boiler installations and maintenance. All of these subjects are taught, however, with reference to specific sets of plans. Frequently the class is instructed to draw up a set of plans for a heating job or power plant to test its knowledge of the practical value of what it is learning in theory.

Along with the course the instructor pays attention to English and grammar, and business correspondence is taught in the form of sample letters written on the various phases of a typical heating installation.

In work of this kind the importance of the instructor cannot be overestimated. Needless to say, ordinary schoolroom methods would fall down miserably if applied to a class of apprentices learning a trade, which many of them think they have mastered the first week of their time. What sometimes amounts to a supreme contempt for "school stuff" must be overcome. But in its place must be instilled an interest in and an ambition for more information along the lines of their chosen trade that cannot be taught on the job.

So this is what the school is doing. Journeymen who are graduating from this new kind of apprenticeship are coming forth better equipped to do the work cut out for them. They have a broader vision of the science of heating. And, while they work with the tools, they have a new attitude toward their employers, who have seen them through the five years of schooling.

Who knows but that this school, and others like it, may not some day result in a new era in relations between master and journeyman? For "the apprentices of today are the masters of tomorrow." And to have better masters there must be a thorough training of apprentices.

The "Chicago idea," as the work of this school has been called, is attracting considerable attention. And for this reason Mr. Getschow, Mr. Hill and their many associates are doing everything they can to perfect the system of instruction and get the most satisfactory results.

The pupils are very enthusiastic over the instruction, which always is a good sign. Not only do they study the course, but they are eager to buy books on steamfitting.

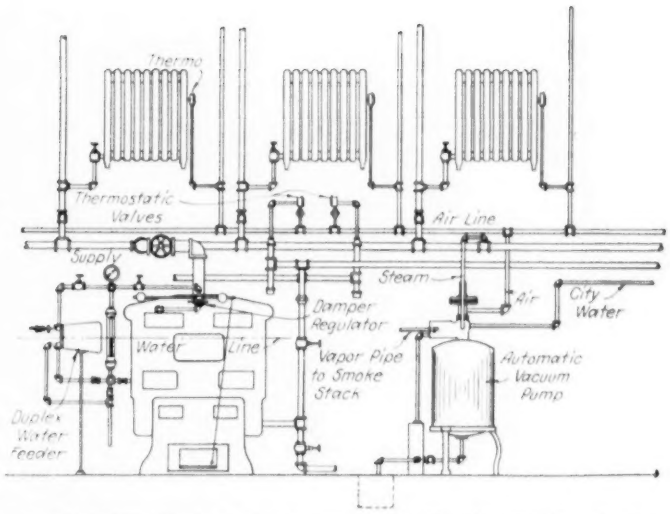
THE time has come to quit "viewing the apprenticeship problem with alarm." Someone has got to teach young Americans that you cannot turn down a dignified calling that pays as well as plumbing and heating, if you like mechanical work of that kind. — Alfred Beyrodt, Chairman of Apprenticeship Committee of the Bronx Borough Association of Master Plumbers.

Vapor and Vacuum Heating Systems

The Third of a Series of Articles Containing a Complete Treatise on Vapor and Vacuum Heating, With Many Illustrations*

By E. R. Pierce

(Continued from Page 275 in the November 18th Issue.)



The McAlear Mechanical Vacuum Pump Air Line Heating System.

The McAlear Air Line System of Vacuum Heating.

THIS is a mechanical vacuum system produced by the McAlear Manufacturing Company, of Chicago, Illinois. This company also produces a system of strictly vapor heating which will be described later in this series of American Vapor Heating systems.

The McAlear system of vacuum and vapor heating seems to be in some of its features so nearly identical with what was, at one time, known as the Sparks Automatic Pump Company system that a description of the McAlear will answer very well for both systems.

This system is claimed as a distinct improvement over the older type, such as the original Williames and its immediate successors.

The fundamental diffefence is largely in the use of an automatic vacuum pump, which when the system is used solely for heating will automatically produce a desired degree of vacuum through the entire system including the boiler itself, thereby enabling steam, or vapor (if one prefers the word) to be produced from water which is considerably below 212 degrees in temperature. For instance, with 15 inches mercury pressure instead of 30 inches, which would be atmospheric pressure, steam will be produced from water of 178.8 degrees temperature, and as this steam per pound has more heat units than steam at atmospheric pressure there is a material saving in large plants, providing always that the proper amount of radiating surface is installed in the rooms to be heated.

In connection with the automatic vacuum pump the system also uses a special automatic air valve.

The McAlear two-pipe air line system method of installing, which is shown herewith, is easily adapted to places where exhaust steam can be used for heating, enabling such plants to circulate exhaust or live steam by removing all back pressure from engines, pumps and so forth.

It is now in order to give a description, necessarily not very full without detailed drawings, but perhaps enough to give a fair idea of the automatic vacuum pump used in the McAlear air line system shown in the illustration. The pump consists of a large cylinder which stands vertically on a substantial base. On the top of the cylinder is mounted the automatic valve mechanism to which all air, steam and water connections are made.

The air connections consist of the vacuum air lines, which connect with all the air valves on the entire installation. The steam for operating the pump is taken from the low pressure heating main used for heating, or from the boiler direct if that is run on low pressure, and connected to the steam valve which is a part of the mechanism placed on the top of the cylinder above mentioned.

The water for condensing purposes is taken usually from the city water pressure and connected to the water valve of the mechanism, all of these connections being controlled and directed in operation by the automatic valve mechanism and a thermostatic motor, mounted on the top of the cylinder.

When the pump is in operation, steam enters the cylinder through the steam valve and forces the air contained in the cylinder out through the discharge pipe at the bottom into the water seal trap. After the air is completely discharged from the cylinder, a small amount of steam passes from the cylinder into the water seal trap and from this point is carried up through a pipe to the thermostatic motor chamber causing the thermostatic disc to expand and open a valve which permits the city water pressure to be exerted on the diaphragms of both the steam and water valves at the same instant, closing the steam valve and opening the water valve, thereby admitting water to the cylinder in the form of spray, condensing any steam or vapor that may be in the cylinder and producing a very positive vacuum.

While the water is entering the cylinder it is also entering the thermostatic motor for the purpose of cooling and reducing the pressure therein. When this has been accomplished, the spring above the valve disc will automatically close the water valve.

The vacuum produced by the pump is sufficient, at this point, to hold the steam valve closed by its passing from the pump cylinder through a series of small port holes in the steam valve bonnet to the under side of the diaphragm, holding it in a locked position with steam and water valves closed.

The valves will remain closed until the cylinder vacuum drops to nearly, or quite, four inches, when the spring over the steam valve diaphragm will release that valve and permit the steam to enter the cylinder again and drive the air pulled from the system by the previous stroke of the pump out of the cylinder through the discharge. This process continues as long as steam is supplied to the cylinder.

The thermostatic motor is the power plant of the pump. It gets its thermostatic action from the volatilization of a liquid confined in a number of small metal discs with flexible

*From "A Practical Manual of Steam, Vapor and Hot Water Heating," by E. R. Pierce. Just Published by Domestic Engineering Co.

walls. The power of these discs is always in direct proportion to the temperature to which they are subjected. This power is directed by the mechanism in such a manner as shall make the upward and downward strokes of the pump positive and quick.

A steam pressure of one-half pound, or at least four ounces above atmosphere, is required while the pump is discharging. The pump is said to work perfectly up to 10 pounds pressure as the maximum.

It will be interesting to note the elimination of the automatic pump and the development of a straight vapor system as will be shown later in the description and illustration of the McAlear Vapor Heating System.

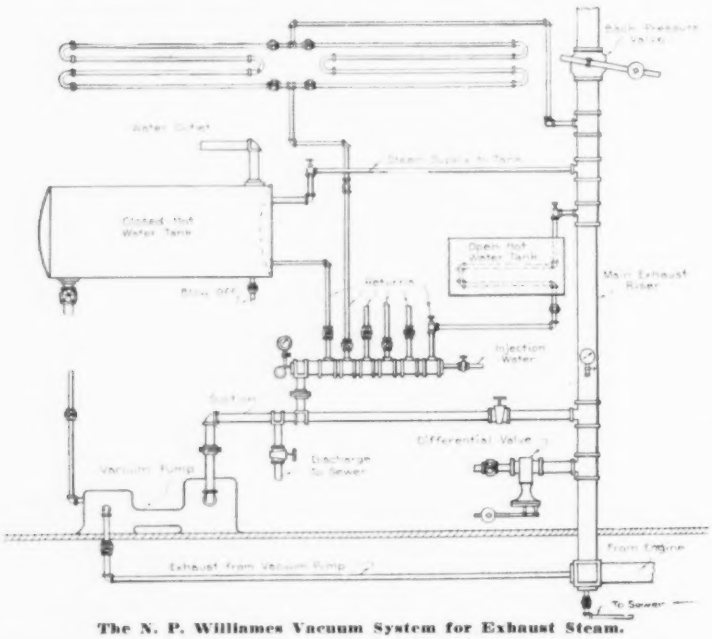
Vacuum Pump Heating Systems.

THERE is another class of vacuum heating that now needs attention, namely, those that use vacuum pumps and use certain specialties that they have by experience found necessary in order to secure best results. And what has been said in regard to the gravity system people is equally true of the others.

The Williames and Webster Systems.

The oldest vacuum pump system in this country is what is known as the Williames system. That and the Webster system are so near alike that a description of the latter will answer for both, the chief difference being in the use of a thermostatic valve located in the pipe return from each radiator.

The operation of both systems is primarily based upon



The N. P. Williames Vacuum System for Exhaust Steam.

the "flow of steam and condensation from a pressure slightly above into a pressure slightly below that of the atmosphere, or into a partial vacuum."

With this system a partial vacuum is maintained upon the return piping only, therefore it is always a two-pipe system. In the Williames system an automatic valve, which was called a back pressure valve, was placed at the discharge end of the exhaust pipe adjusted with weights to any desired pressure. This valve was adjusted to open and discharge the steam when the pressure exceeds the desired pressure and to close when the pressure falls. When the steam supplied is not greater than can be condensed and removed in the form of water or steam by the vacuum pump, a vacuum will be produced throughout the entire system and may extend clear to the engine; the pressure of the steam in the radiators will at once lower, first to atmospheric pressure, and if the vacuum is increased to still lower pressures. The remedy for this is, of course, to increase the steam pressure at the boiler. On the other hand, if the pressure in the system caused a greater supply of steam than can be condensed, the back pressure valve would open and relieve the pressure, but this action will be intermittent, during which the pressure in the main exhaust will be above the atmosphere and the temperature considerably above 212 degrees Fahr. The exhaust or vacuum pump will under this condition pull the steam, the water of condensation and the entrained air through the piping and radiators, and through this action produce several inches of vacuum.

While this was a great improvement over conditions that had been accepted during a period of more than thirty years, it placed much care and responsibility upon the engineers in the boiler room.

In a very short time the Webster improvement was patented. This consisted in placing a thermostatic valve in the return piping at the return end of each radiator and pipe coil; this valve is supposed to open when the temperature falls below that of the steam, and to close at the instant that the temperature rises to that of the steam. As this action takes place at the return end of each radiator, theoretically at least, there is complete condensation in each radiator, so that the vacuum pump has only the entrained air and the water of condensation to handle.

With this improvement over the original Williames patent it is easy to understand why the Williames system was so soon merged into the Webster system as a commercial proposition.

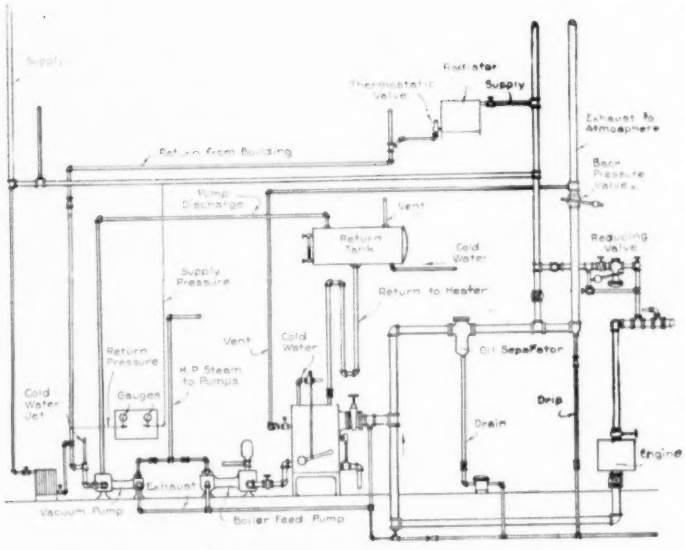
Various minor improvements have been made during the last twenty years in the mechanical features, but no change in the fundamental idea upon which the Williames system was patented. All later patents embodying this idea have been granted as improvements.

The N. P. Williames Vacuum System for Exhaust Steam.

IT will be noticed that the exhaust from the engine is received into a large stand-pipe with an automatic valve at the top to prevent any atmospheric pressure from entering the system. The steam is taken from the top of the stand-pipe and from that point supplying the radiation in the system. The returns from the radiation all enter a large branch tee which has a provision for the injection of cold water to serve as a condensing medium.

The suction pipe of the air pump is connected to the branch tee and acts to pull the atmospheric pressure from the entire heating system. The system of heating is shut off during the summer by the closing of certain valves.

The valve at the top of the stand-pipe can be adjusted to equal any desired pressure inside. It is so arranged that it will open and discharge steam when the pressure becomes greater than that at which the valve is set to balance, and to close the moment that the pressure falls to the balance point. An objection that was sometimes raised against the system was that, when the steam supplied was not greater than could be condensed and removed in the form of water and steam by the vacuum pump, the vacuum that would be formed often extended to the engine itself, the temperature



The Webster Heating System.

in the radiators would fall below the boiling point of water, this temperature depending upon the inches of vacuum produced.

On the other hand, when the steam was supplied in excess of that which the apparatus could condense, the valve at the top of the stand-pipe would open spasmodically and the pressure in the main exhaust would remain above 14.7 pounds, or atmospheric pressure, and of course the temperature of the steam would be slightly above 212 degrees.

Under this latter condition it was found that the exhausting device would pull steam, condensation and air through the heating system and sometimes produce considerable vacuum at points farthest from the initial steam supply and extend to the entire system, but not be evenly distributed.

During the seven or eight years that the Williames system was being attacked in the courts for alleged infringements of other patented devices, inventors were busy in trying to devise a way to overcome the objections raised against the Williames system.

* * *

The first successful advance on the Williames idea, that I know, was the Webster system. It will be seen that this differs from the Williames principally in the use of a thermostatic valve placed at the return end of each radiator, otherwise there is not a great change except in a certain refinement in detail.

These two systems can be clearly called the foundation upon which all of the various mechanical vacuum systems are created, each in its turn reaching its result over some variation in the road of travel.

The Webster System.

A TYPICAL installation of the Webster system is shown herewith. The steam is fed to the radiators at the top through a special valve, and the return end of the radiator through a trap valve, automatic in its action.

This valve prevents the escape of steam from the radiator but, as the steam in the radiator cools, the condensation falling to the bottom of the radiator is somewhat cooler than the steam itself, and the thermostatic member of the valve at the return end of the radiator opens to permit the condensation to flow into the return, and the air to follow so that the vacuum pump only handles the water of condensation and the air. It has no action upon the supply pipe for steam, or upon the steam fed to the radiator.

The Paul System.

THIS system was at first offered as an entirely new idea in heating, but upon closer investigation it will be found to be simply an innovation and improved adaptation of the Williames idea.

It is rather more complicated in construction than the Webster system but has the advantage of being applicable to single pipe work which is not possible with the Webster system.

The Paul system differs very much in its general construction from either the Williames or the Webster, yet in the actual piping for a large building it is often found to be laid out for two pipes and quite similar to the other two.

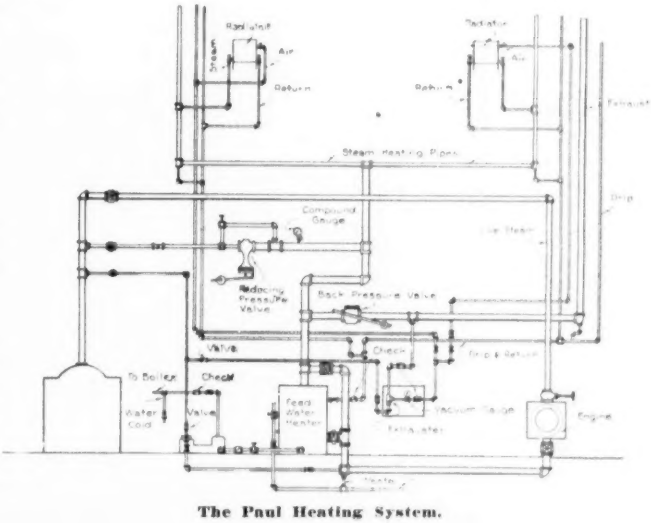
The difference lies more in the principle by which the results are secured than in any new idea or basic foundation upon which to build a departure from the Williames idea, as that idea was an altogether new proposition in heating.

The Paul system, instead of using one large pump connected to the main return pipe and from that with all the radiators, employs a small pump which is termed an exhauster. This can be operated by water or steam under pressure, and this is connected to a pipe fitting in communication with a series of air pipes, each of which leads to a thermostatic valve attached direct to each radiator. The thermostatic valve is presumed to close at the temperature of the steam and it will discharge air only. The drips from the pipe lines and radiators are connected into a receiver which is connected with the atmosphere by a pipe in which is placed a check valve opening inward in order to prevent a vacuum. The water returned to the receiver can be wasted or pumped to be used again. The air returned to the receiver is discharged from it in the usual method in such cases.

In the practical operation of the Paul system in large buildings, the usual method is to pass the exhaust steam through pipes in a feed water heater in order to warm the feed water without contaminating it with oil; it is then permitted to rise to the top of the building from whence it flows to the radiators. The system is arranged so that live steam can be used whenever it may be required.

It is the one advantage possessed by the Paul system that it frees the radiators from air more rapidly than its predecessors.

(Continued on Page 402.)



The Paul Heating System.

We Want Good Then Better and Then Best

By O. F. Faps

THE extent of buying in the American markets is set not by "how much," but by "how good." In the largest purchases, the quibble is not about the quantity for the money paid, but about the quality. Regardless of the amount of coffee the modern housewife gets for a dollar, she wants it good. And that tendency is growing every day. Originally we started with the idea that we wanted things good; then better; and now we want the best.

You can remember the time when the man who smoked fifteen cent cigars was regarded as either rich or a spendthrift. The modern smoker wants quality first, quantity second. The ox-cart, the tricycle, the bicycle, the buggy, the carriage, the barouche, the one-lung auto and the modern motor car—each had its day, and each one was an improvement upon its predecessor.

Very often you hear an automobile driver say: "The automobile has gone the limit. It can't very well be improved. It is the acme of perfection." But the automobile manufacturer, or the maker of sanitary appliances, who stands still, will get lost in the shuffle.

No improvements in motor cars! There are motor car improvements in the air more astounding than the motor car itself. The present automobile is a comparatively inefficient machine compared with what it will be in a few years, according to some engineers, and, in like manner, to judge of the improvements that will be made in sanitary and heating arrangements, think of the improvements that have been made.

I was driving a demonstrating car a few days ago, going about twenty miles per hour.

"Now throw her into reverse," said my companion.

"I dare not," said I, "I will strip the gears or wreck the machine."

"Oh, no you won't," said he. "Go ahead and do as I told you."

And I did. My heart was in my mouth. The wheels gripped the pavement, slid a short distance, then started slowly backward. No clash of gears, no grating, and not a bit of sound.

We drove to near the top of a very steep, curved hill, with a gully a hundred feet deep on the left and a perpendicular cliff on the right.

"Now," said the demonstrator, "we are climbing a mountain in the Sierra Nevadas, if you can stretch your imagination that far. We haven't enough power to reach the top of the hill and the brake will not hold."

"I shivered to think what the result would be if it were really true. It has been true many, many times in the West, and the bones of whole families are bleaching deep down in bottomless gullies.

"Well," said the demonstrator, "we will slide backward down the hill at two miles an hour on compression." And while the engine was turning the drivers at a thirty-five mile speed without making any headway, he quickly shot the transmission into low, killed the engine and slid down the hill, the compression acting as a brake.

Truly, whatever the mind of man can conceive of he will accomplish, and whatever he makes that is an improvement over present methods will find a market.

I remember—and it seems only yesterday, or the day before—when an eminent doctor said: "I wish somebody would invent a mixer, so that I could turn one faucet and get hot water or cold, or any degree of temperature I want."

Well, that has happened. And it was left to A. V. Gemmill, of the Speakman Company, to give this mixing idea a popular and easily-understood name. The name is "nozzle-mixed water." Say it again: "nozzle-mixed water." Sounds good, doesn't it?

The present type of bath room and other sanitary equipment may seem the acme of perfection now. That there will be great improvements in this, as well as in every line of sanitation and heating, is extremely likely. And when these improvements come there will be buyers, for it is quality not quanity that makes sales.

People You Meet Every Day

IS THIS MISTER FATHEAD?
YES SIR, AND YOU'RE THE PLUMBER, I CAN TELL BECAUSE I JUST TELEPHONED FOR YOU. YOU KNOW I REALLY COULD HAVE DONE THE WORK MYSELF
THERE IS JUST A SLIGHT LEAK AN' I'VE LOCATED IT. IT IS SOME WHERE BETWEEN THE BATH ROOM AND THE BIG PIPE UNDER THE LAWN. JUST FIND THE PLACE AND PASTE IT UP WITH SOME WHAT'S THE NAME STUFF
NOW MY DEAR SIR, THAT ISN'T THE RIGHT TOOL. WHAT YOU NEED IS THAT OTHER THING. YOU SEEM TO WASTE A LOT OF TIME LOOKING FOR THE RIGHT TOOL
SAY WHAT DO YOU WORK AT, YOU KNOW SO MUCH ABOUT PLUMBING?
SIR! I'M A LADIE'S TAILOR

Published by Courtesy of the Tomlinson Co., Inc., Philadelphia.

THE WISE GUY

Moral.—There is only one bigger fool in the world than the man who knows it all. And he is the fellow who wastes time arguing with him.

Two Years Old, Going On Three

THIS, then, is about the way it happened. The day was Sunday. And in a hotel in a city in Ohio a group of traveling salesmen sat passing the time. The truth is there wasn't much else to pass, except, perhaps, the "buck." For, be it known, this particular Sunday was in the early fall of 1920. Just then manufacturers and jobbers generally were complaining about the independence of their salesmen. "Why," said the big bosses, "our salesmen are too independent to take orders from anybody."

So, in a hotel in a city in Ohio some salesmen sat passing the time and the "buck." After a while they got round to their favorite topic: How to increase business.

During the talkfest or buckfest —what is the right word?—one of the salesmen said something about reading something somewhere. He didn't remember much about where it was or what it was. All he remembered was this: Somebody had suggested to a soap company that it could increase its sales by selling the public the idea of taking more baths. A few of the salesmen nodded their heads, a couple laughed, and one sneezed or coughed. Then the group drifted away to other subjects.

But one of the salesmen refused to drift. The bathing idea stuck. He couldn't sleep for thinking about it. He did more than think. He used up a lot of hotel stationery in figuring out plans. Then he took a train for Chicago and "Domestic Engineering." His name was, and, for a matter o' that, still is Fulton S. King, of "Domestic Engineering's" advertising staff.

Mr. King presented the bathing idea, as he saw it, to the management of "Domestic Engineering." The management was quick to see how more bathing would help plumbing and heating; also soap; also the human family.

And there, on the spot, the Bath a Day movement was born.

The management went into the subject thoroughly. It consulted authorities, read books and, in the words of Davy Crockett, who tramped the wilderness and bathed in rivers, was sure it was right before it went ahead.

THEN, on November 27th, 1920, "Domestic Engineering" announced the Bath a Day movement to the plumbing and heating worlds. So, you see, a Bath a Day is now two years old, going on three.

And what a youngster it is. It keeps on growing. There is no end to it. It is impossible to tell how far its influence has traveled. But of this we are sure: It has spread over the United States, gone into Canada and Mexico, and entered Europe. That is a bit of going for a two-year-old.

There is still plenty of room for further growth. As an advertising man recently said: "If everybody in the plumbing and heating field would shout Bath a Day as loud as they could shout it for a year, they wouldn't be able to take care of the increased business." That's what he said.

Many plumbing and heating manufacturers, jobbers, dealers and contractors are shouting. Others are daily taking up the cry. Close behind the plumbing and heating men, and sometimes ahead of them, march soap companies, brush companies, gas companies, schools, colleges, boards of health, clubs, hospitals, newspapers, associations, and so on and so forth.

Five million Bath a Day stickers have been stuck on five million pieces of mail; thousands of window signs, buttons, posters and copies of an envelope stuffer called, "The Need of Frequent Bathing," have been put to good use. The slogan, "A Bath a Day Keeps You Fit Every Way," has found its way into the corner of thousands of newspaper advertisements, and newspapers themselves have given much space to the telling of the value of the daily bath. The National Trade Extension Bureau has made a Bath a Day its regular campaign feature for June. And so the movement spreads and spreads and grows and grows.

THEN, more than a year after the birth of a Bath a Day, arrived "The Story of the Bath." This was on February 22nd—Washington's birthday. "The Story of the Bath" is a Bath a Day's younger but very helpful brother. It immediately jumped into popularity. It leads more people to the bath than anything that ever has been written. Whole families and whole communities are reading it. Its author gathered from everywhere the points that go to make up this entertaining story.

As these lines are being written a county superintendent of schools is ordering enough copies of "The Story of the Bath" for all of her teachers, the copies to go as Christmas presents. Frederick E. Fladd, chairman of the educational committee of the National Association of Master Plumbers, is mailing a letter and a copy of "The Story of the Bath" to the secretary of every local association. He urges the associations to offer copies of the story to their schools, and in this way carry the message of bathing into the homes and minds and hearts of the people.

It would be easy to go on and on and tell of this and that —all good Bath a Day work. But let us stop. And while we stop let us remember that a business is not built half so much by selling what we have to sell, as by selling what the things we have to sell will do for the human race. In other words, you can't sell a man a bathroom until after he has been sold bathing.

A Bath a Day sells bathing, and bathing sells the things with which bathing is done. And that is why "Domestic Engineering" started the movement. It helps those who do the selling and it helps those who are sold. And there isn't any kind of a movement that can beat that, is there?

May a Bath a Day grow until it finds its way into every home in every country of this old world of ours.

Validity of Compromises.

An agreement of compromise, like any other contract, may be avoided or set aside for fraud, deceit, or mistake, but not otherwise. So holds the Supreme Court of Arizona, in Phillips v. Musgrave et ux., 206 Pacific Reporter, 164, where it says of one of the parties that, whatever his motive for compromising, so long as it was not induced by mistake or the fraudulent misrepresentations of the other party, it was binding. Statements of the law are that it favors the compromise and settlement of disputed claims and will sustain such settlements if fairly made, because it is to the interest of the state that there should be an end to litigation. Therefore a court of equity, in the absence of fraud or mistake, will not aid a party to an action to violate a settlement of the litigation out of court, voluntarily entered into with the other parties.

The settlement of a controversy is valid and binding, not because it is the settlement of a valid claim, but because it is the settlement of a controversy, and when such settlement is characterized by good faith the court will not look into the question of law or fact in dispute between the parties, and determine which is right. All that it needs to know is that there was a controversy between the parties, each claiming in good faith rights in himself against the other and that such controversy has been settled.

* * *

Payment of Checks Received at One Time.

There is a difference of opinion as to the duty of a bank with respect to checks presented through the clearing house at the same time, where the deposit is not sufficient to meet them all. It is said on the one hand that none should be paid, and that any other course would render the bank liable to the holders of the dishonored paper, and on the other that the bank must pay the checks to the extent the deposit admits, but in any order it sees fit. But the Supreme Court of Kansas holds, in Chadd v. Byers State Bank et al., 206 Pacific Reporter, 880, that, whatever may be the rule in such case, where a bank receives by the same mail a number of checks drawn against it by the same person, whose deposit is not large enough to meet all of them, if it applies the amount on hand so far as it will go to the payment of the checks in any order it sees fit, it will not thereby render itself liable to the holder of a check remaining unpaid, assuming that there was no exceptional reason for preference.

* * *

Care Required of Banks to Protect Drawers of Checks.

As between a bank and its customers, the general rule is that, in order to charge the account of a depositor, a bank must pay a check only to the payee named, or his order, and payment made otherwise is at its peril, unless it can claim protection upon some principles of estopel or negligence chargeable to the depositor. The rule is that a banker on whom a check is drawn must ascertain at his peril the identity of the person named in it as payee, and whether his indorsement thereon is genuine. It is only when he is misled by some negligence or fraud of the drawer that he can set up his own mistake in this particular against the drawer.

The bank's obligation is to pay the checks only upon a genuine indorsement. The drawer is not presumed to know, and in fact seldom does know, the signature of the payee. The bank must, at its own peril, determine that question. It has the opportunity, by requiring identification when the check is presented, or a responsible guaranty from the party presenting it, of ascertaining whether the indorsement is genuine or not. When it returns the check to the depositor, as evidence of a payment made by its direction, the latter has the right to assume that the bank has ascertained the fact to be that the indorsement is genuine.

Where by the fraud of a third person a depositor of a bank is induced to draw a check payable to a nonexisting person or order, the drawer, being ignorant of the fact and intending no fraud, does not authorize the bank to pay it and charge the amount to the account of its customer, although it appears to have been indorsed by the party named therein as payee. Such indorsement is, in effect, a forgery, and the payment of the check by the bank confers no right on the bank as against the drawer of the check.—Supreme Court of Minnesota, in City of St. Paul v. Merchants' National Bank, 187 Northwestern Reporter, 516.

* * *

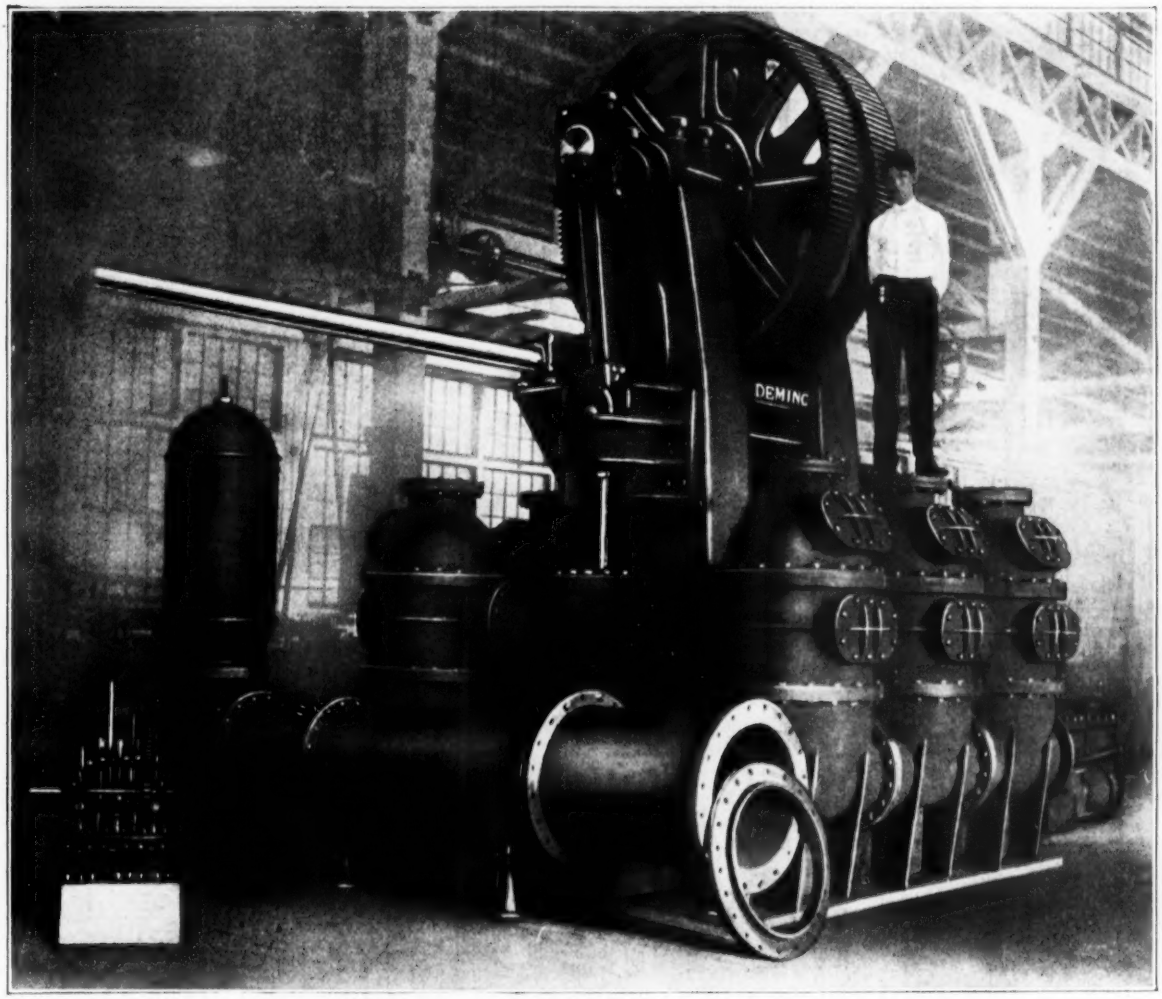
Rules as to Measurement of Damages for Breach of Contract.

The Supreme Court of North Carolina says that the following has been generally accepted as an accurate statement of the rules applicable to the measure of damages for breach of contract:

Where two parties have made a contract which one of them has broken, the damages which the other party ought to receive in respect of such breach of contract should be such as may fairly and reasonably be considered either arising naturally, i. e., according to the usual course of things, from such breach of contract itself, or such as may reasonably be supposed to have been in the contemplation of both parties, at the time they made the contract, as the probable result of the breach of it. Now, if the special circumstances under which the contract was actually made were communicated by the plaintiffs to the defendants, and thus known to both parties, the damages resulting from the breach of such a contract, which they would reasonably contemplate, would be the amount of injury which would ordinarily follow from a breach of contract under these special circumstances so known and communicated. But, on the other hand, if these special circumstances were wholly unknown to the party breaking the contract, he, at the most, could only be supposed to have had in contemplation the amount of injury which would arise generally, and in the great multitude of cases not affected by any special circumstances, from such a breach of contract.

That, the court goes on to say, in Builders' Supply and Equipment Corporation, Inc., vs. Gadd, et al, 111 Southeastern Reporter, 771, approves two rules: (1) If the particular contract cannot be distinguished from the great mass of similar contracts, only such damages may be recovered as would naturally and generally result from the breach; (2) but, if there are special circumstances communicated to or known by the other party at the time the contract is made, special as well as general damages may be recovered. Accordingly, where a person violates his contract, he may be liable in given circumstances not only for losses sustained, but for gains prevented. Profits are not considered as an element of damages if purely speculative or conjectural, or measured by an indefinite or fanciful conception as to what they would have been had there been no breach of the contract. But lost profits are a proper element of damages where such loss is the necessary and proximate result of the breach and can be shown with reasonable certainty.

Explaining Soviet reversion to capitalism, Lenine said: "We went too far and we have found nothing is final, that always we must learn from circumstances. We found the peasants and the small bourgeoisie that form the vast numerical majority of our country were against us. To retain power we had to satisfy them."



Here Is Pictured One of the Largest Triplex Pumps Ever Built, and It Is in Use in a Western State.

The Use of the Air Lift

Pumps Using Air Pressure and Data About Their Use

By Ed. Cunningham

The Air Lift.

PUMPING by air pressure dates back through centuries of time; the first mention being made in the "Book of Heron," where an ingenious arrangement for supplying a fountain—the "Fountain of Heron"—was made, using air compressed by an elevation of water, three enclosures controlling the movement of the water.

The first practical application of the air-lift, was probably that made by an American engineer named Cockford, who used the method in the oil-wells of Pennsylvania previous to 1850.

The basis of the present practice was laid in the patents of J. P. Frizell, in 1880. Frizell introduced the air much as is done at present, with the addition of an arrangement made in the shape of an hour-glass, and having many minute perforations for breaking up the air into small bubbles.

In the Pohle system the air is introduced freely at the bottom, with the object of forming a succession of large bubbles, or pistons.

The principle on which this system operates may be described in the manner of Pohle by reference to Fig. 29. This is, of course, an imaginary figure, but well illustrates the principle of operation.

The pipes A, B and C are assumed to be open at both ends with the lower end submerged in an open body of water; the water in A being at the same level inside and outside the tube. Imagine now a piston of air being forced downward, outside the pipe, as at B and into the bottom opening. This would have the effect of raising the level of the water within the tube, as at C; a succession of such bubbles, or pistons, of air, would have the effect of raising the level still higher and there would exist within the tube a succession of alternate layers of water and of air, the total weight of which would be just balanced by the static head of the solid water outside the tube extending from the level of the body of water, to the bottom of the tube. This is true whether the water be in an open lake or in the tube within a deep well. In the Frizell system small air bubbles

take the place of the large pistons of the Pohle method. Both are illustrated in Fig. 30; the Frizell method on the left and the Pohle method on the right.

The points of greatest importance in the application of compressed air to pumping from deep wells are the freedom

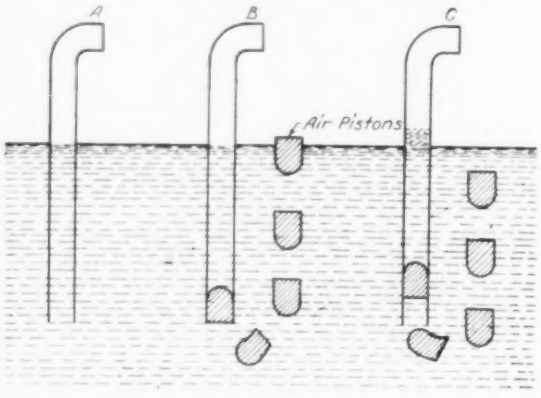


Fig. 29.

of delivery of water into the well from the surrounding strata, and the depth of submergence when the well is pumping, which latter is corollary to the first. If the well proper is shallow it necessarily follows that the limit of height to which the water can be lifted is small. And if the rate of delivery of water into the well is slower than the rate at which it is being pumped out, it soon becomes inoperative. When pumping the height of the water outside the casing always drops to some extent, depending on the freedom of the supply. The submergence when well is pumping, therefore, will be from the bottom of the tube to the "pumping level" outside the tube.

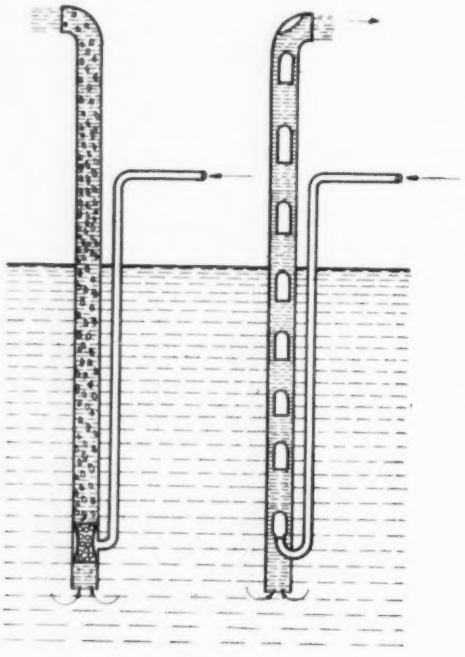


Fig. 30.

The "Compressed Air Magazine," in its "Compressed Air Data" says of this:

As the lift increases the necessary ratio of submergence to lift decreases.

For a given lift and quantity of water the necessary size of discharge pipe increases as the submergence decreases.

Diameter of air pipe depends upon the quantity of air required and its pressure. Air pipe sizes are the standard openings in the foot-pieces. The air pipe used can be of larger or smaller diameter by using suitable reducing fittings. A good rule is to allow from 20 to 25 ft. per second.

Although impossible to construct a formula which can be applied uniformly to all conditions met with in this class of work, yet the trend can be defined and certain rules given which will permit the engineer to calculate the requirements for any given proposition when the exact data covering the case is known. The data required and the factors entering into these calculations are as follows:

Definitions. The characteristics are graphically illustrated in the diagram, Fig. 31, and are as follows:

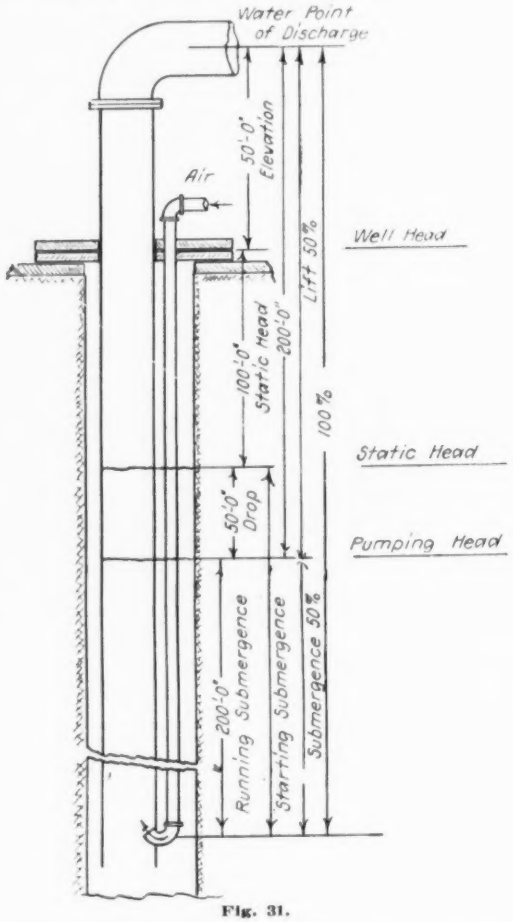


Fig. 31.

Static Head is the distance from the surface of the ground to the standing water level in the well when not pumping.

Drop is the distance the water recedes when the well is delivering a certain quantity of water.

Elevation is the distance above the surface to which it is desired to deliver the water.

Lift consists of the static head, plus the drop, plus the elevation.

Submergence is the depth that the air pipe is cubmerged below the pumping level of the water in the well. There are two classes of submergence—starting submergence, which is temporary, and running submergence, which is the important factor in any pumping proposition. It is usually expressed in terms of the total length of the water column from the point where air is introduced to the point of discharge. Thus 50 per cent means that the total lift, or head, and the

Table 21.

Air Lift Discharge Pipes Capacities in Gallons Per Minute Under Different Lifts and Submergences.

1½-Inch Discharge Pipe.

Lift in Feet	SUBMERGENCE 33% Gal.	35% Gal.	40% Gal.	45% Gal.	50% Gal.	55% Gal.	60% Gal.	65% Gal.	70% Gal.
25					11	12	13	15	16
50				12	13	14	16	17	18
75			12	13	14	16	17	18	20
100			13	14	16	17	19	20	
125			14	16	17	18	20	21	
150			14	16	18	19	21		
175		14	16	17	19	20	22		
200		15	16	18	19	21			
250		16	18	19	20	22			
300		17	19	20	21				
350		17	19	20	22				
400		18	20	21	23				
450	18	18	20	21	23				
500	18	18	20	21					

2-Inch Discharge Pipe.

Lift in Feet	SUBMERGENCE 33% Gal.	35% Gal.	40% Gal.	45% Gal.	50% Gal.	55% Gal.	60% Gal.	65% Gal.	70% Gal.
25					20	22	24	27	30
50				22	24	26	29	31	34
75			22	24	26	29	31	34	38
100			24	26	29	31	34	38	
125			26	29	31	34	37	39	
150			26	30	33	36	39		
175		26	30	32	34	38	40		
200		28	31	34	36	39			
250		31	33	34	39	41			
300		32	35	36	40				
350		33	36	39	41				
400		33	36	39	41				
450	33	33	36	39	41				
500	33	33	36	39					

2½-Inch Discharge Pipe.

Lift in Feet	SUBMERGENCE 33% Gal.	35% Gal.	40% Gal.	45% Gal.	50% Gal.	55% Gal.	60% Gal.	65% Gal.	70% Gal.
25					32	35	38	42	45
50				35	38	41	45	49	53
75			35	38	41	45	54	55	58
100			38	42	45	50	56	58	
125			41	45	49	53	58	61	
150			42	48	53	56	60		
175		42	45	50	55	59	63		
200		44	48	52	56	61			
250		48	52	55	60	64			
300		49	54	58	62				
350		52	55	59	64				
400		53	57	61	66				
450	53	54	58	63	66				
500	53	54	58	63					

3-Inch Discharge Pipe.

Lift in Feet	SUBMERGENCE 33% Gal.	35% Gal.	40% Gal.	45% Gal.	50% Gal.	55% Gal.	60% Gal.	65% Gal.	70% Gal.
25					54	59	64	71	77
50				58	63	69	77	83	89
75			57	64	69	77	83	92	100
100			65	70	78	84	92	99	
125			70	77	84	90	98	104	
150			70	80	88	95	102		
175		72	77	85	93	100	107		
200		74	81	89	95	103			
250		80	87	94	102	109			
300		84	92	99	106				
350		87	95	101	110				
400		90	98	105	113				
450	88	92	98	105	114				
500	89	92	100	107					

3½-Inch Discharge Pipe.

Lift in Feet	SUBMERGENCE 33% Gal.	35% Gal.	40% Gal.	45% Gal.	50% Gal.	55% Gal.	60% Gal.	65% Gal.	70% Gal.
25					77	84	92	102	109
50				82	90	98	109	115	127
75			81	91	98	110	119	130	142
100			92	100	111	120	132	142	
125			100	110	120	129	140	148	
150			100	114	123	136	146		
175		99	109	121	133	143	153		
200		106	115	127	136	148			
250		115	125	134	146	156			
300		120	132	144	156				
350		125	136	145	157				
400		129	141	148	159				
450	126	129	141	150	162				
500	127	132	143	151					

4-Inch Discharge Pipe.

Lift in Feet	SUBMERGENCE 33% Gal.	35% Gal.	40% Gal.	45% Gal.	50% Gal.	55% Gal.	60% Gal.	65% Gal.	70% Gal.
25					107	117	128	142	153
50				115	126	137	153	165	178
75			114	127	137	154	166	181	198
100			129	140	155	168	184	198	
125			139	153	168	180	195	208	
150			139	159	176	190	204		
175		141	154	169	186	200	214		
200		148	162	178	191	207			
250		160	174	188	203	218			
300		167	184	197	211				
350		173	190	202	219				
400		180	195	209	225				
450	175	181	196	211	228				
500	177	184	200	214					

4½-Inch Discharge Pipe.

Lift in Feet	SUBMERGENCE 33% Gal.	35% Gal.	40% Gal.	45% Gal.	50% Gal.	55% Gal.	60% Gal.	65% Gal.	70% Gal.
25					139	152	166	185	199
50				150	164	178	199	215	231
75			148	162	178	200	216	235	257
100			168	182	202	218	239	257	
125			181	199	218	234	254	270	
150			189	207	229	247	265		
175		183	200	220	242	260	278		
200		192	211	231	248	269			
250		208	226	244	264	283			
300		217	239	256	274				
350		225	247	263	285				
400		234	254	272	293				
450	228	235	255	274	296				
500	230	239	260	278					

5-Inch Discharge Pipe.

Lift in Feet	SUBMERGENCE 33% Gal.	35% Gal.	40% Gal.	45% Gal.	50% Gal.	55% Gal.	60% Gal.	65% Gal.	70% Gal.
25					193	211	230	256	275
50				207	227	247	275	297	317
75			205	227	247	277	298	326	356
100			232	252	279	302	331	356	
125			250	275	302	324	351	374	
150			250	286	317	342	367		
175		254	277	304	335	360	385		
200		266	292	320	344	373			
250		288	313	338	365	392			
300		301	331	355	380				
350		311	342	364	394				
400		324	351	376	405				
450	315	326	360	380	410				
500	319	331	363	385					

These figures give the economical capacity of discharge pipe under different conditions of lifts and submergences, but a 25 per cent increase can be obtained by an increase of the volume of air supplied.

Table 21.

Air Lift Discharge Pipe Capacities in Gallons Per Minute Under Different Lifts and Submergences.

(Continued from Preceding Page.)

Lift in Feet	SUBMERGENCE 33% Gal.	35% Gal.	40% Gal.	45% Gal.	50% Gal.	55% Gal.	60% Gal.	65% Gal.	70% Gal.
6-Inch Discharge Pipe.									
25					300	328	358	398	428
50				322	353	384	428	462	495
75			319	354	384	431	464	507	554
100			361	392	434	470	515	554	
125			389	428	470	504	546	582	
150			389	445	493	532	571		
175		395	431	473	521	560	600		
200		414	454	498	535	580			
250		448	487	526	568	610			
300		468	515	552	591				
350		484	532	566	613				
400		504	546	585	630				
450	490	507	549	591	638				
500	496	515	560	599					
7-Inch Discharge Pipe.									
25					428	468	512	568	612
50				460	504	548	612	660	712
75			456	508	548	616	664	724	792
100			516	560	620	672	736	792	
125			556	612	672	720	780	832	
150			596	636	704	760	812		
175		564	616	676	744	800	856		
200		592	648	712	764	828			
250		640	696	752	812	872			
300		668	736	788	844				
350		692	760	808	876				
400		720	780	836	900				
450	700	724	784	844	912				
500	708	736	800	856					
8-Inch Discharge Pipe.									
25					589	644	704	781	842
50				633	693	754	842	908	980
75			627	699	754	847	913	996	1000
100			710	770	853	924	1012	1089	
125			765	842	924	990	1073	1144	
150			795	875	968	1045	1122		
175		776	847	930	1023	1100	1177		
200		814	891	979	1050	1139			
250		880	957	1034	1117	1200			
300		919	1012	1084	1161				
350		952	1045	1111	1205				
400		990	1073	1150	1238				
450	963	995	1078	1160	1254				
500	974	1012	1100	1177					
10-Inch Discharge Pipe.									
25					1070	1170	1280	1420	1533
50				1150	1260	1370	1530	1650	1780
75			1140	1270	1370	1540	1660	1810	1980
100			1290	1400	1550	1680	1840	1980	
125			1390	1530	1680	1800	1950	2080	
150			1490	1590	1760	1900	2040		
175		1410	1540	1690	1860	2000	2140		
200		1480	1620	1780	1910	2070			
250		1600	1740	1880	2030	2180			
300		1670	1840	1970	2110				
350		1730	1900	2020	2190				
400		1800	1950	2090	2250				
450	1750	1810	1960	2110	2280				
500	1770	1840	2000	2140					

submergence are equal. The necessary percentage of submergence varies in accordance with the lift; low lifts require proportionately more submergence than high lifts. As the lift increases the necessary submergence decreases. The range of these percentages is found within the following limitations:

For a lift of 20 ft., 66 per cent.

For a lift of 500 ft., 41 per cent.

The first calculation usually leads to the size of the compressor required, and the operating pressure:

Va=Free air (actual) required to raise one gallon of water.

h =Total lift in feet.

H=Running submergence in feet.

C=Constant as given in table.

To calculate the air volume required, the following closely approximating average practice and in part suggested by Edward A. Rix, A. S. M. E., may be used. The Table 20 also shows the value of C under various heads with the proper submergence:

Formula:

$$Va = \left(\frac{h}{C \log \frac{H+34}{34}} \right)$$

Table 20 for value of C with proper submergence:

Lift in Feet (h)	Constant
10 ft. to 60 ft., inclusive	.338
61 ft. to 200 ft., inclusive	.326
201 ft. to 500 ft., inclusive	.292
501 ft. to 650 ft., inclusive	.257
651 ft. to 750 ft., inclusive	.223

The next calculation in order would be to find the starting and working pressure. Starting pressure = depth of foot piece in well less the static head ×.434. Working pressure= depth of foot piece in well less the pumping head ×.434 + friction in air pipe + 2 pounds back pressure in nozzle or foot piece. The actual pumping level in a well or group of wells can seldom be known in advance of a test. It is customary to assume certain conditions of lift and submergence, basing such conclusions on experience, and to proceed to pipe the wells accordingly. After the piping is installed and the working conditions arrived at, the submergence is altered to suit by raising or lowering the pipe in the well until the best rates are established.

The quantity of water a well will supply depends upon its diameter and yield, and it is also essential that the pipes both for air and water be properly proportioned, for the reason that velocity of flow is an important factor, for if too large a pipe is used the air gets through without doing all the work it should. On the other hand, if the velocity is too high there is undue friction loss, also inefficient expansion of the air bubbles.

Acknowledgment for use of data, tables, and other material is made to: Wm. Rogers, "Pumps and Hydraulics;" Wm. M. Barr, "Pumping Machinery;" Edmund M. Ivens, B. E., E. E., "Pumping by Compressed Air;" Compressed Air Magazine, "Compressed Air Data," edited by Wm. Lawrence Saunders and Chas. Austin Hirschberg, member A. S. M. E.; The Goulds Mfg. Co., "Bulletins;" Fairbanks, Morse Co., "Bulletins;" McAlear Mfg. Co., "Bulletins;" American Pump Co., "Bulletins;" Jennings Nash Co., "Bulletins;" Connersville Blower Co., "Bulletins;" and to John R. Freeman, C. E.; Geo. C. Ellis, C. E.

Reports are confirmed that J. P. Morgan recently returned to New York from London, having failed to get the European Governments to agree to his conditions for the discussion of a project for a huge international loan to Germany.

Mr. Morgan has spent the last two months in constant travel getting first hand knowledge of actual conditions in Europe with a view to making a report on the practicability of an international loan.

About a Frog *that* Sat on a Log

Dealers and Contractors: One Advertising Editorial, with a border around it, is printed each week. Use these Editorials in your local newspaper advertising. They will stimulate public interest in plumbing and heating, cause people to appreciate your service to the community, help your business and increase sales without additional expense.

THIS is the way it goes. A frog sat on a log. The frog thought it would jump off the log. But all the frog ever did was to think. So the frog still sat on the log. And that's all there is to the story. It is short and simple, but it carries a point or a moral, if you care for points or morals.

To make the moral a bit more plain, suppose we try another story? It runs something like this: A plumber sat in his shop. He thought he would move out of the side street into Main street. And he thought, when he got settled in his new place, he would have a good showroom and a couple of windows with stop-the-crowd displays. But all this plumber ever did was to think. So he still sits in his shop back on the side street.

And the point of this second story is that too many plumbers are still sitting and still thinking in the side street, and wondering why they don't do more business. All business depends upon people. To do the most business and make the most money a dealer must be where the most people go—where the most business is done and the most money is made. That's plain enough, isn't it?

From Side Street to Main Street.

But here comes another kind of a story. The other day the Advertising Editorial man met a plumbing dealer and heating contractor who had moved out of the side street. He is now on a street where the most business is done, and he has a fine showroom and two attractive window displays. In fact, the store is so inviting that the Editorial man went inside. And what did he find? He found a dealer so blue that the whole place took on an indigo tint.

What was the matter? The Editorial man didn't know, and the dealer didn't seem to be able to tell him. So the Editorial man waited.

In a few minutes a passerby stopped, looked at one of the window displays, turned, and came into the store.

"I was just looking at that heater in the window," said the passerby. "It seems to me that that's about the right thing."

"Yes, I guess it is," said the dealer, in a sort of a listless, bluish tone.

"Well, I'll see you again," and the passerby passed out and on.

Then the Advertising Editorial man knew what the matter was.

A Good Plumber May Be a Poor Salesman.

That dealer may be a very good plumber, but he has not yet learned the art of merchandising. And until he does learn merchandising his Main street store will not be a success. The dealer had moved from a shop in a side street, but he was still using side-street methods. And that's the pity of it. Perhaps he moved too soon. To be a plumber is one thing; to be a merchant plumber is something else. It takes as much study and application to be a merchandiser as it takes to be a plumber.

To sit and think side-street methods is to be like the frog that sat on a log. They don't get you very far. And to move to Main street before you are ready for Main-street methods is to flirt with failure. Main street is the best place in town, but it takes more than being there to stay there.

The dealer we have been talking about has the right location; he has the right kind of a showroom; he has the right kind of window displays. But he lacks two of the important things which lead straight to success. These things are the right kind of advertising and the right kind of salesmanship. If he had these, or if he would take the time to cultivate them, his blueness would soon turn a rosy rose. The mechanical ends are important. So are the selling ends.

Five Steps in Merchandising.

These lines are written to help all dealers who are thinking of bettering their locations. It is a fine thing to move into Main street. It shows ambition, and such moves help the progress of the plumbing and heating industries. But don't for a minute think that a Main street location, with its beautiful showroom and its attractive windows, is all that is necessary for successful merchandising. A busy business location is the first step and the right step. The next step is a showroom, and the next is inviting windows. These, coupled with good advertising, bring people in. But after they are in they must be sold. And that takes salesmanship and the knack of making friends.

Not all good dealers can be good salesmen. But salesmen can be hired, the same as journeymen and helpers. Study advertising, study salesmanship, and then hire men and women to do the selling, if you do not feel competent to do it yourself.

There is a great field for merchandising plumbing and heating goods. And just what is merchandising? To merchandise is to advertise, display and sell goods at a profit. And the art or science of merchandising can be cultivated. For, be it known, the greatest merchandisers were not born with a gift for selling. They acquired it through long study and hard work.

Be like the frog in one way. That is, sit and think. But when you have thought out your course, and know Main street is the place to land, jump!

It is only natural that every dealer should want to have a store in the thick of Main Street. And the surest way to land there, and stay there after he lands, is to begin the practice of Main Street methods while still doing business in the side street.

Small banks train bankers for big banks; minor leagues train baseball players for major leagues. And so it goes. The small plumber can grow into a big plumber if he studies, thinks and works for bigger and better things.

A Series—No. 53.

WHERE DO YOU BUY MEAT?

THEY were talking, as they sometimes do. And so said a man to his wife: "When you want to buy meat, where do you go?"

Said the woman to her husband: "Why, to the meat market, of course. Where did you suppose?"

Said the husband: "Well, you never can tell. When you went out to get the new things for the bathroom, I wondered why you didn't go to a plumbing store."

Said the wife: "I never thought of that."

Have you ever thought of it? Have you ever thought that when you want a shower, or a towel bar, or a soap dish, or a medicine cabinet, or a radiator shield, or any one of a hundred other similar useful things, the plumbing store is the place to get it? Well, it is.

Since you go to a meat market to buy meat, try going to a plumbing store to buy plumbing goods. That's the place to see the largest assortment and to get the best values.

QUESTIONS & ANSWERS

This department is a clearing house for ideas and is open to every reader of "Domestic Engineering." Problems sent in are replied to at the earliest possible moment by "Domestic Engineering," and this department can be made more valuable if readers themselves will help the man who needs assistance. Read the questions and answers. If you have had similar problems, or know from experience how the faults can be remedied, do not hesitate to send in your comment or criticism. It will be some satisfaction to you to know that you have helped a fellow craftsman and a pleasure for us to pass on the data. "Every man owes some of his time to the upbuilding of the profession to which he belongs."

FIGURING RADIATION FOR A GREENHOUSE.

Editor, "Domestic Engineering:" The accompanying sketch shows a small greenhouse to be heated by hot water pipe coils placed on two sides of the greenhouse. A temperature of 60 degrees in zero weather is desired. Please tell me how many ft. of 2-inch or 1½-inch pipe are required?

Illinois. H. A. C.

The amount of pipe coil required to heat a greenhouse to 60 degrees in zero weather can be estimated by considering the equivalent number of sq. ft. of glass surface in the house. In a greenhouse practically all of the exposure is glass surface as will be noted by Fig. 1, which represents the sketch submitted with the above letter. For such wall surface as is used we figure 4 sq. ft. of it as being the equal of 1 sq. ft. of glass in cooling value. A belt of concrete wall 3 ft. high extends around all four sides of this house which equals 106.5 sq. ft. of glass.

Reference to the measurements given will show that there is 1,150 sq. ft. of glass surface in the roof and 492 sq. ft. of glass in the ends and sides. Adding 106.5 gives a total of 1,748.5 sq. ft.

On the sketch submitted no doors are shown. We assume that there is a door at each end of the house as suggested by Fig. 1, but have not considered the same.

There is practically one-half of a sq. ft. of surface in one lineal foot of 1½-inch pipe and .622 sq. ft. in one lineal foot of 2-inch pipe; therefore, 466÷.5=932 lineal ft. of 1½-inch pipe required, or 466÷.622=750 ft. of 2-inch pipe required to maintain the desired temperature.

ABOUT THE HEATING OF A MACHINE SHOP.

Editor, "Domestic Engineering:" The accompanying sketches show a machine shop built of steel framework out in the open, exposed on all four sides. It is of corrugated iron and glass, with no linings or partitions. How much radiation will it take to heat it to 70 degrees? Assuming that the iron and glass are tight, how many ft. of 1¼-inch pipe will it require to make up the radiators in coils?

Indiana. W. J. C.

To illustrate the size and character of the building described in the above letter correspondent submits three sketches showing respectively a floor plan, end elevation, and a side elevation of it. Fig. 1 shows the floor plan with division of space, size of doors, and other details indicated, and Fig. 2 the end elevation. The side elevation sketch is not illustrated as all of the construction details are given on the end elevation shown by Fig. 2.

As will be noticed there is a strip of corrugated iron 4 ft.

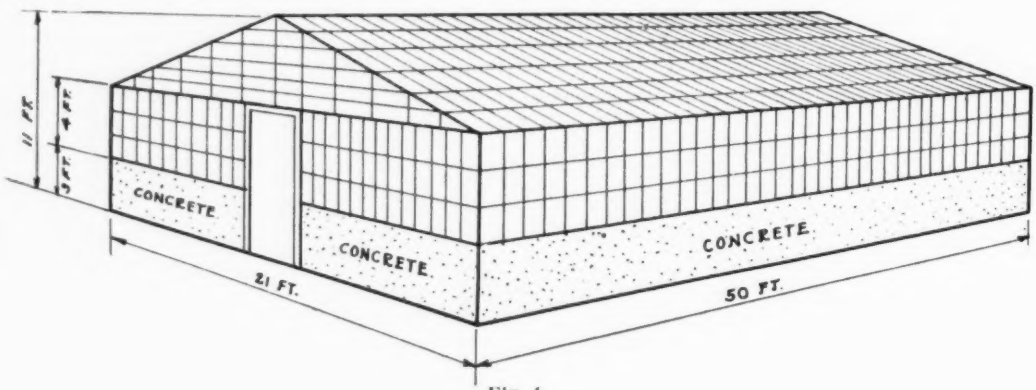


Fig. 1.

The amount of coil surface (radiation) to be installed to heat the house to 60 degrees in zero weather will depend upon the temperature at which the water is carried in the heating apparatus. We will assume that the water is carried at a temperature of 180 degrees. On this basis each three and three-quarter (3.75) sq. ft. of glass will require 1 sq. ft. of radiation. 1,748.5÷3.75=466 sq. ft.

high, extending around all four sides of the building except for the spaces occupied by the doors. Above this strip of iron, and reaching 12 ft. high to the eaves of the building, is window sash housing a large number of small panes of glass. The upper part of each end and the roof also is constructed of corrugated iron. All of the exterior of the building is cooling surface and must be estimated accordingly.

There is but little difference in the rate of heat transmission through glass and through sheet iron walls or roofs. With a temperature difference of 70 degrees (70 degrees inside and zero outside), the B. t. u. transmitted through glass is variously estimated as 78 to 80 B. t. u. per sq. ft. per hour and through sheet iron from 80 to 84 B. t. u. For the purpose of estimating the heat loss from this building, we may therefore consider all of the exposed surface as being constructed of glass. Using a factor of 80 as the average of the B. t. u. transmitted per sq. ft. per hour, we estimate as follows:

Sq. ft. iron in ends plus glass and doors	2,225
Sq. ft. iron in sides plus glass and doors	3,200
Sq. ft. iron in roof plus glass and doors	5,600
Total sq. ft. of exposed surface	11,025

11,025×80=882,000 B. t. u. loss per hour.

A sq. ft. of surface in a low pressure steam coil will give off about 300 B. t. u. per hour, therefore, 882,000÷300 =2,940 sq. ft. of radiating surface required to maintain a 70-degree temperature inside of the building in zero weather.

With reference to the size of the coils, it requires 2 lineal ft. of 1½-inch pipe to equal 1 sq. ft. of surface, or two and three tenths (2.3) if 1¼-inch pipe is used. You would require 5,880 lineal ft. of 1½-inch or 6,762 lineal ft. of 1¼-inch pipe coil to heat the building to 70 degrees.

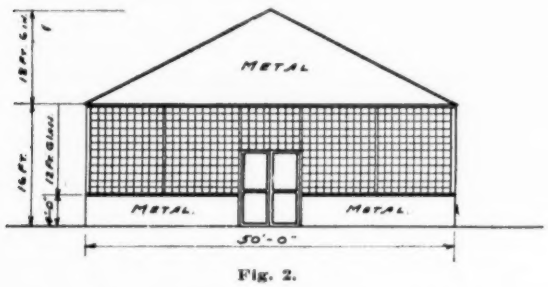


Fig. 2.

This seems an extreme temperature for a building of this character and we should judge that an average temperature of 60 degrees would prove sufficient for every requirement.

SIZE OF MAINS FOR STEAM HEATING JOB IN GARAGE.

Editor, "Domestic Engineering:" Please give me your opinion in regard to the accompanying sketch: Are the mains and returns of the proper size? Please tell me if you see any way in which I could improve on it. This installation is for a cement block garage, 50x112 ft., with all sides exposed. Kindly state also how many ft. of radiation I have in each coil in the sketch.

New Jersey. T. S.

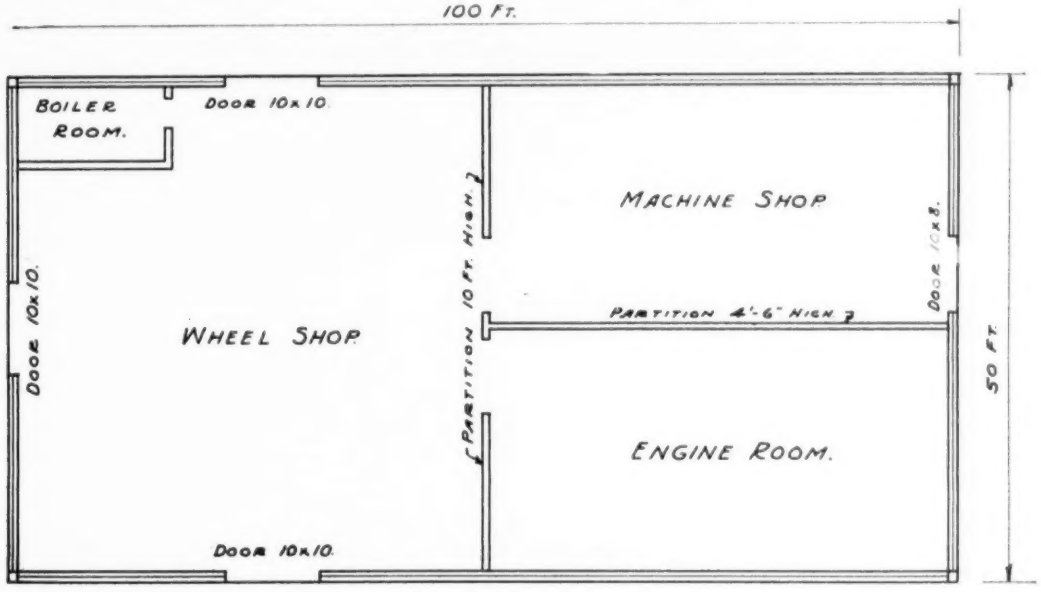


Fig. 1.

The sketch submitted is intended to show the installation of a low pressure gravity steam heating apparatus in a building used as a garage. An overhead system of piping is planned and the illustration is more or less covered with explanatory notes. As the sketch is drawn partly in plan and partly in elevation we cannot well reproduce it in detail. As the piping, etc., on either side of the building is alike we show by Fig. 1 one-half of the system as we interpret the sketch. Solid lines are used to indicate flow pipes and dotted lines to indicate return pipes and drips.

Although the size of the building is given (50x112 ft. area with a 12-ft. ceiling) it is quite impossible to estimate the amount of radiation required for the work, as the number and size of windows and doors are not given nor is it stated whether or not the interior is open to the roof.

Four pipe coils are shown—two on either side of the building—which are each 50 ft. long and eight pipes high. Assuming that they are constructed of 1½-inch pipe, each coil contains approximately 200 sq. ft. of surface. Should 1¼-inch pipe be used for the coils each coil of the size stated would contain 174 sq. ft. Straight manifold coils are shown. Coils of this design should never be used for steam because no provision has been made for the expansion and contraction of the pipes. Use either the mitre type or the corner type of coil.

As to the size of mains, branches, returns, and other piping, the sizes marked are full size for the work. A 4-inch main from the boiler is ample to supply all radiators in the building, and this main should supply two 3-inch mains—one on each side of the building. The supply to each coil can be 2-inch although under ordinary conditions 1½-inch would be ample. Drip pipes from the end of each main and from

the bottom of the 4-inch riser can be 1¼ or 1½-inch. Returns from the coils can be 1 or 1¼-inch and the main return on each side of the building can be 2-inch as shown.

We regret that correspondent did not give us sufficient data to enable us to check up the entire job. If the building has the normal amount of exposure, glass, wall, etc., there will be sufficient radiating surface as figured.

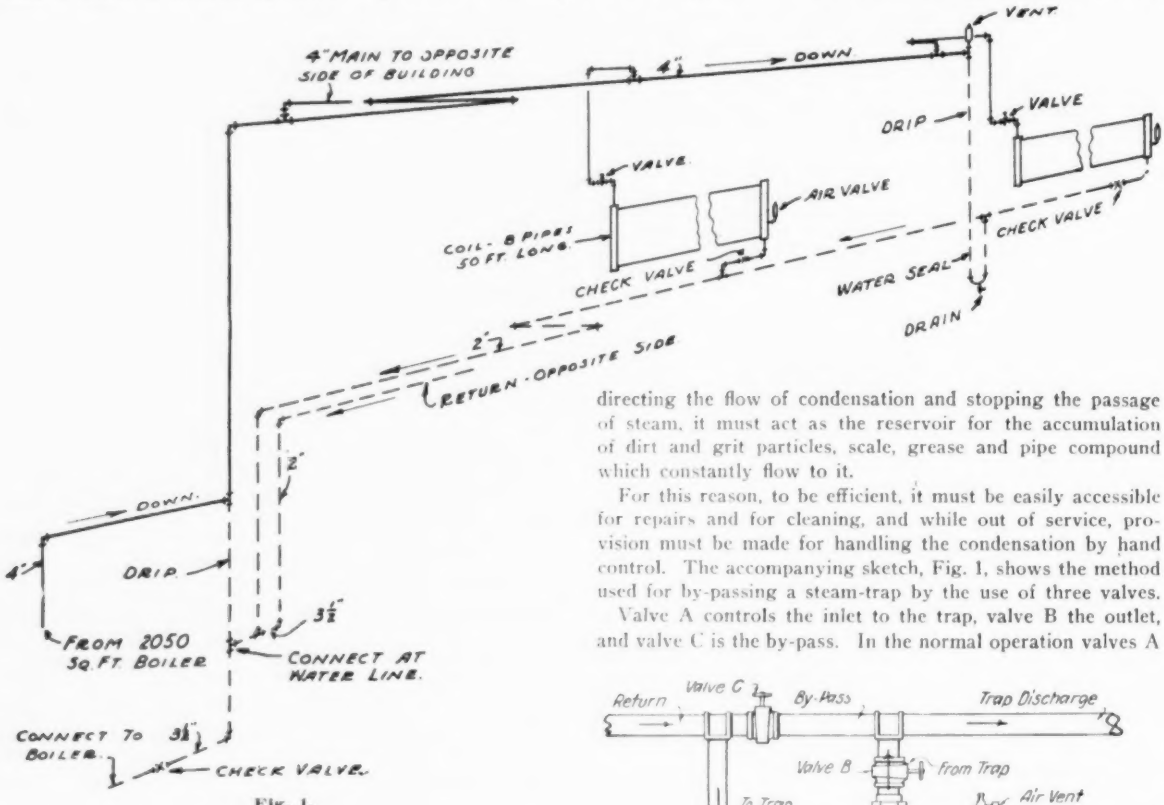


Fig. 1.

THE OPERATION OF SWING CHECK VALVES.

Editor, "Domestic Engineering:" I would like to ask if friction on a wet return pipe line, 100 ft. long, makes any difference in opening a swing check valve at the boiler, or does altitude make the only difference.

You will do me a favor by answering this question in an early issue.

Colorado. H. P.

We do not know that we clearly understand correspondent's question.

The operation of a check valve, when placed in a return line, depends upon the pressure or weight of water against the clapper of the check, and this pressure or weight is secured by the height of water in the return above the check.

In some types of check valves more pressure is required to operate them than is required by checks of other types. If the clapper of the valve is thick and heavy and rests on the seat, for example, at an angle of 45 degrees, a greater pressure will be required to operate it than would be necessary if the clapper was lighter and hung more nearly vertical in the valve. We have reference to check valves of the swing type as we assume that it is this style of valve to which correspondent refers.

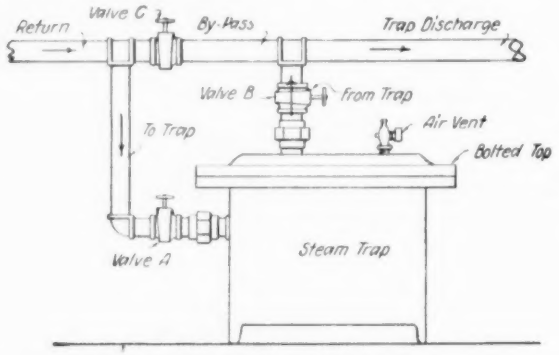
The friction in 100 lineal ft. of pipe will no doubt lower the pressure somewhat. The amount of reduction, however, is so small that it need not be considered.

STEAM TRAP PIPING WITH BY-PASS.

There is no device about a heating or power plant which is subjected to harder service than a steam trap. It is always at a low point and in addition to acting as the medium for directing the flow of condensation and stopping the passage of steam, it must act as the reservoir for the accumulation of dirt and grit particles, scale, grease and pipe compound which constantly flow to it.

For this reason, to be efficient, it must be easily accessible for repairs and for cleaning, and while out of service, provision must be made for handling the condensation by hand control. The accompanying sketch, Fig. 1, shows the method used for by-passing a steam-trap by the use of three valves.

Valve A controls the inlet to the trap, valve B the outlet, and valve C is the by-pass. In the normal operation valves A and B are open, the condensation passes through A into the trap, and is discharged through B, valve C being closed. When the trap is to be opened for examination, valves A and B are closed, and valve C operated by hand as required.



Steam Trap Piping with By-Pass.

MOTION PICTURES TEACH SANITARY AND HEATING ENGINEERS HOW TO SELL.

The Detroit Association of Sanitary and Heating Contractors has appointed a committee, composed of Bruce Wigle, J. J. Schannell, and George Strachan, to take charge of the program for each meeting of this organization. These are really educational meetings, and the committee will endeavor to obtain programs that will be of an instructive nature, as well as interesting, so that each member may carry away with him something that will prove of lasting benefit.

At their last meeting motion pictures, furnished by the Duro Pump Co., of Bay City, Mich., illustrating methods of securing business, lining up prospects and similar phases of the business, were shown.

Legal Questionnaire

Does the New York State Law Call for Separate Contracts for Plumbing and Heating Work In Villages Outside of Cities of First, Second and Third Class?—This Question Is Answered In a Most Thorough Manner*

By "The Judge"

Provisions of the Statute Requiring Separation of Plumbing and Steam Fitting Contracts from General Contract in New York.

Editor, "Domestic Engineering":—Does the law existing in New York State call for separate contracts for the plumbing, heating and electrical work in villages and districts outside of the cities of the first, second and third class?

Can a contractor put in a separate bid for any of the above mentioned or does he have to contract for all of them? We are working on this question in our county. B. J.

Answer:—Chapter 469 of the New York State Laws of 1921 reads: Section 1, Article 5 of Chapter 29 of the Laws of 1909, entitled "An Act relating to municipal corporations, constituting Chapter 24 of the consolidated laws" is hereby amended by adding at the end a new section, to be section 88, to read as follows:

"Section 88—Separate Specifications for Certain Contract Work.—Every officer, board, department, commission or commissions, charged with the duty of preparing specifications or awarding or entering into contracts for the erection, construction or alteration of buildings in any county or city, or the borough of any city, when the entire cost of such work shall exceed $25,000, must have prepared separate specifications for each of the following branches of work to be performed:

"1. Plumbing and gas fitting.

"2. Steam heating, hot water and ventilating apparatus.

"Such specifications must be so drawn as to permit separate and independent bidding upon each of the classes of work enumerated in the above subdivisions. All contracts hereafter awarded by any county, city or borough, or a department, board, commission or commissioner, or officer thereof, for the erection, construction or alteration of buildings or any part thereof, shall award the respective work specified in the above subdivisions separately to responsible and reliable persons, firms or corporations. Nothing in this section shall be construed to prevent the authorities in charge of any county or municipal building from performing any such branches of work by or through their regular employees, or in the case of public institutions, by the inmates thereof."

Section 2. Article 2 of Chapter 58 of the Laws of 1909, entitled "An Act relating to state finance, constituting Chapter 56 of the consolidated laws" is hereby amended by adding at the end thereof a new section, to be section 50, to read as follows:—

"Section 50. Separate Specifications for Contract Work for the State.—Every officer, board, department, commission or commissions, charged with the duty of entering into contracts for the erection, construction or alteration of buildings for the state, when the entire cost of such work shall exceed $25,000, must have prepared separate specifications for each of the following branches of work to be performed:—

"1. Plumbing and gas fitting.

"2. Steam heating, hot water and ventilating apparatus.

"Such specifications must be so drawn as to permit separate and independent bidding upon each of the classes of work enumerated in the above subdivisions. All contracts hereafter awarded by the State or a department, board, commissioner or officer thereof, for the erection, construction or alteration of buildings or any part thereof, shall award the respective work specified in the above subdivisions separately to responsible and reliable persons, firms or corporations. Nothing in this section shall be construed to prevent the authorities in charge of any state building from performing any such branches of work by or through their regular employes, or in the case of public institutions, by the inmates thereof.

In 1912, your Assembly enacted a law, almost word for word like the above, except that the act applied to all buildings which were to cost over $1,000, or any alterations costing more than that sum. Then in 1921, the Assembly repealed the act of 1912, leaving the law of the state where it was before 1912, that is, without the requirement for separate contracts.

As the laws of New York for 1922 have not yet been published for public distribution in their final form, I am unable to state whether this year's Assembly has again changed, repealed or amended the above Act of 1921. The speediest way to learn whether the 1921 act has been changed is to write to your Assemblyman, or to your state association secretary or legislative committee.

I would call your attention to the fact that the 1921 Act does not require the separation of electrical contracts. The former 1912 Act also did not require electrical contracts to be separated. It may be that you referred to electrical contracts because the electrical contractors in one state that I know of have joined with the plumbers and steam fitters in an endeavor to secure just such legislation, and it may be that the movement is one inaugurated by the national association of electricians, and is being carried out in the various states by the local associations.

The wording of the act would seem to cover only such contracts as are entered into by the proper officers of a county or city, or borough of any city. It would also seem that it would make no difference that the contract might call for a building in a town or district outside the three classes of cities, as long as the contract was to be awarded by county officials.

Replying to your second question, the act clearly requires that the contracts for plumbing and gasfitting shall be entered into separately from the contracts for steam heating, hot water and ventilating apparatus. On the other hand it would seem that the contracts for plumbing and gasfitting must be included in one agreement, and the contracts for steam heating, hot water and ventilating apparatus must be included in an-

(Continued on Page 402.)

*Every Effort is made to the End that these Answers may be authoritative. However, we cannot assume any Responsibility because of the Very Nature of the Service, which is rendered without a personal interview.—Editor.

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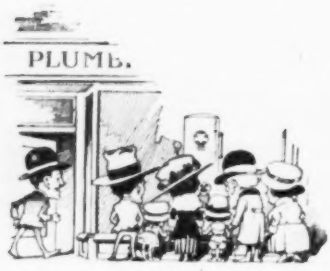

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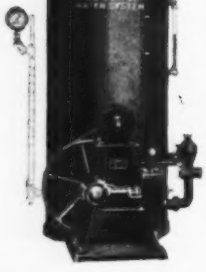

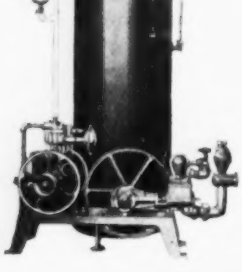

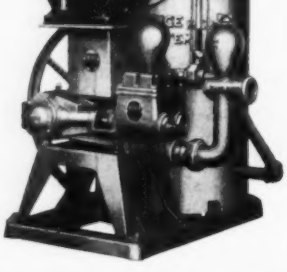

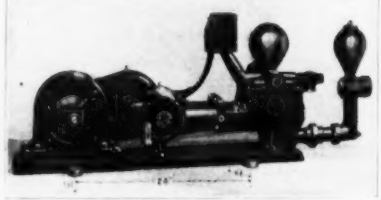

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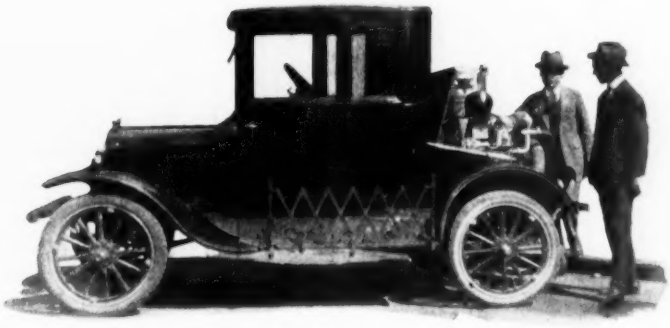

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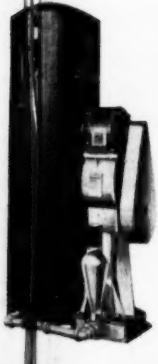

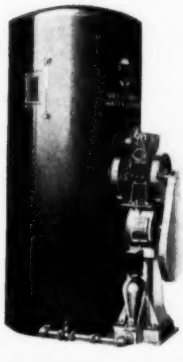

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The Duro Pump & Mfg. Co. —RUSH—
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Standard Piping Details

Piping for a Low-Pressure Boiler on One Pipe Gravity Steam Heating System, With Two Circuits—Two Methods Described and Illustrated

THE simplest form of steam heating is the one pipe gravity steam system. This consists of a steam main rising to a high point immediately above the boiler, and grading downward in a continuous circuit, returning to the boiler to a point above the water line, where the main is vented and drops to the bottom return connections of the boiler.

The accompanying illustration, Fig. 1, shows the piping at the boiler for such a system, with some additions in the way of refinements which will improve the operation of the plant. The boiler is a cast iron sectional with three supply openings; all of these are shown connected up to a header; this is the best method as the velocity of the steam leaving the boiler is low, and the entrainment of moisture is at a minimum. In the case of a boiler located near one end of a building it is usually more practical to run one continuous main in a circuit. The cut shown is of a boiler located near the center of a long building, and two separate circuits are run from the steam header, with separate returns; each return is provided with an automatic valve for venting the air; in addition there is shown a small size gate valve on each; this is a very useful addition, as they may be opened when first starting up to expel the air rapidly, and are closed when steam blows through; thereafter the automatic air valve takes care of the accumulation of air.

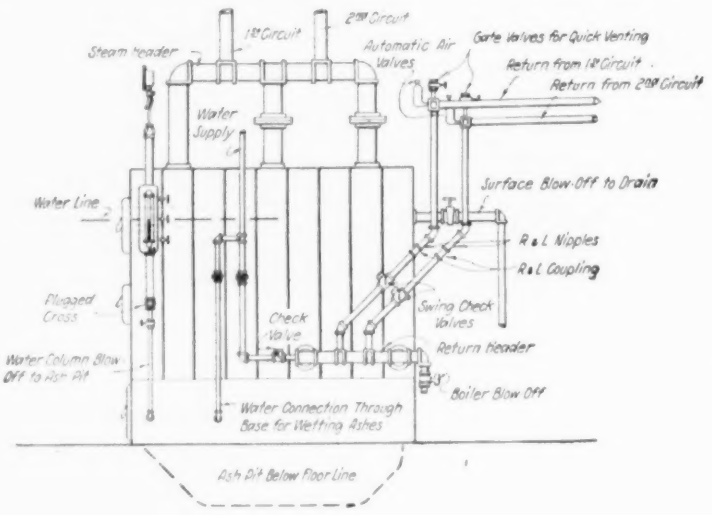


Fig. 1.

Swing check valves are located on the return below the water line; these are for checking a backward movement of water, during monentary sudden rise in pressure in the boiler, and are shown placed on an angle of 45 degrees, this position leaving the flap in a vertical position, reducing resistance to the returning condensation.

The return header is connected to two openings to the boiler, but may be connected to one only; a blow-off is at the end of the return header; this should terminate at a drain above the floor line, so that any leakage which may exist may be observed.

A water supply connects to the return header; this is provided with a gate valve and a swing check valve. From a point above the gate valve a connection is taken off, provided with gate valve, and entering ash pit through a hole drilled in the base. This is very useful for wetting the ashes, and for improving the combustion by passing vapor up through the fire; further it is a great aid to the preservation of the grates. An ash-pit is shown under the boiler; this is a great convenience, permitting more space for ashes, preventing burning out of grates, and may be kept partly filled with water.

A valved connection is shown, at the water line of the boiler. This is very convenient for skimming the accumulation of oil and grease from the surface of the boiler, which should be done periodically in addition to an occasional blowing off from the bottom opening.

The bottom connection of the water-column is shown made up with a cross with the unused side plugged; this is for rodding out of dirt and scale, and the plug should be brass to permit easy removal. From the bottom of the cross a small valved connection is run and discharges into the ash-pit for frequent blowing-off of the water column. This will maintain the column in good working order and help to keep the gauge glass clean.

The connections from the boiler to the steam header are shown with flanges on two of the risers; they may be placed on all three if desired, but this is not necessary, as the first riser may be screwed into place, the header made up with the upper half of the flanged connections for the other two screwed into place, and the entire make-up swing into place.

Simple Connections at Boiler for One-Pipe Steam Heating Systems.

A simplified method of making the piping connections at the boiler for a one-pipe steam job is shown in Fig. 2; this indicates a cast iron sectional steam boiler having two supply openings, and four return openings —two on each side—one side of course not being shown. The accepted practice is to connect up both supply openings and join them into one steam main, the highest point being immediately above the boiler, and the main grading downward from that point, making a circuit, returning from the last connection as a dry return to a point above the water line of the boiler, where the air is vented by an ordinary automatic air valve, and the return drops and enters the boiler. One of the returns on the side of the boiler, and both on the opposite side are plugged. A swing check valve is placed on the return from the heating system, and the connection is made to one end of a tee, the return to the boiler being from the side of the tee; the other end of the "run" of the tee serves to blow off the boiler through a blow-off cock as shown, and also receives the water connection from the fresh water supply, a gate valve and a check valve being placed in the water supply line.

The water column, and the gauge glass are provided with the usual drain cocks of small size furnished by the boiler manufacturer.

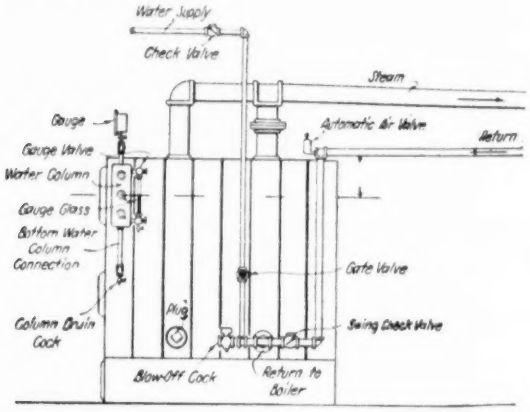


Fig. 2.

Although the arrangement shown in Fig. 1 is the better practice, where the matter of economy must be taken into consideration, the method shown in Fig. 2 should prove very satisfactory.

BLACKBOARD EPIGRAMS

THE chilly days are on the way. If people do not stop as often to read the epigrams, or linger as long as they did in the good old summertime, the fault is not with the blackboard idea. The idea remains the same. But nippy weather makes most of us move along. Keep on writing a fresh epigram every morning on the blackboard out in front of your place of business. Do this and the habit will keep on growing. Perhaps we will have to make the epigrams shorter to fit the weather. But that will be easy. Here are seven more epigrams—one a day for a week. They ought to be as good for the month of December as for September.

A million or more epigrams have been written, and new ones are being printed every day. So, if you do not find here the kind that suit you, spend an hour or two in a library picking the epigrams you like. Epigrams are one-line sermons. They hit hard because they say much in few words. They reduce a thought to an essence, and then shoot that essence with a bang. The epigram is exceptionally good in advertising.

Saving people make a safe community.

* * *

No one can cheat you out of success but yourself.

* * *

In the midst of life we are in debt.

* * *

Blessed is the man who knows a big thing from a little one.

* * *

We love the people who love the things we love.

* * *

When you feel blue, take a bath and cheer up.

* * *

Most of the things we worry about never happen.

A BATH GIVES BIRTH TO A BRILLIANT IDEA.

By L. B. Spafford.

I got a good idea 'tother day,
It pierced my brain, and now I want to say
Some folks are just that nervous
"To labor" or "To service,"
On bills will make a difference in your pay.

Just how I got the notion I will tell.
I nearly told the man to go to—well,
I didn't anyhow.
I think you will allow
That I have trained my nervous temper well.

On Tuesday night when I came home from work,
There stood a man as swarthy as a Turk.
His face was awful red
And he was mad, he said,
Because his bathtub faucet got a quirk.

He demanded that the thing be fixed at once,
Although it had been leaking months and months;
And I must then go out
And fix the blooming spout,
As though I daily did that kind of stunts.

I didn't stop to get a bite to eat,
But drove right off at once to find the street
Where swarthy-face abode,
Got lost upon the road
Directed by a copper on his beat.

At last I found the house where he lived at,
And on the porch was nothing but a cat.
The cat began to swear
And tear its auburn hair;
Some say 'twas me—I won't say as to that.

And if I did, I had a good excuse;
For after taking all that man's abuse,
No soul was there about,
Inside the house or out.
I merely smiled and whispered, "Oh the deuce."

At last he came at twenty after nine.
He came from Thompson's, where he'd been to dine.
Said he, "Now get to work,
And don't you dare to shirk;
I've got to give a bath to Emiline."

The bath was such a miniature affair,
I said, "For such a bath I wouldn't care."
"Oh, Emiline's the cat,"
Said he, "and as for that—
To take a bath myself I wouldn't dare."

Next day he came to argue with the clerk
Who charged him up with just two hours' work;
But when he saw the bill,
He got so deathly ill,
He fell down in my bathtub with a jerk.

I turned the water on to bring him to.
"How much," said I, "do you think should be due?"
The bath cleared up his brain,
So he saw straight again:
"Oh my," said he, "two hours are two few."

The sousing that I gave him was a bird,
And then I told him things you never heard.
Here's the moral of this spasm
Of rank iconoclasm:
"Don't charge for WORK, for SERVICE is the word."

How to Figure Percentage*

Subtracting the Overhead and Desired Per Cent of Profit From One Hundred, and Then Dividing the First Cost of the Article by the Result Is the Proper Method of Arriving at Selling Price

By G. W. Hafner

TRADITION says: "Figures don't lie." Yet, the wrong interpretation of figures may throw the head of the business completely off the track. Mercantile agencies report that a large number of commercial failures are directly due to the proprietor's or manager's belief that the business is making a profit; when, as a matter of fact, it is running at a loss. And the reason for this is that, in at least the majority of cases, the business man has been deceived by the use of percentages in allowing for profits.

What Is Percentage?

IN using percentages as a tool to work with, we should have a clear understanding of what percentage is. Percentage is a standard of comparison for amounts, just as a thermometer is a standard of comparison for temperature, or an inch, foot or yard is a standard of comparison for lengths. The words "per centum" mean 100 parts or 100th. Therefore amounts are compared by per cent or hundredths, as lengths are compared by inches and feet, and temperature by degrees.

Accordingly, one amount compares with another amount as each contains a less or a greater number of 100ths, in the same manner that one temperature compares with another temperature according as it contains a greater or less number of degrees, or that one length compares with another length as it contains a greater or less number of inches. It is seen from this that percentage is simply a means for measuring figures.

How to Find Percentages.

IN finding percentages we always have a clearer view of the matter if we put the figures in the shape of a fraction. Percentage, from the viewpoint of mathematics, is fundamentally nothing else but decimal fractions. You say that 50 is one-half of 100. That means that 50 is fifty one-hundredths or 50 per cent of 100. Likewise 20 is twenty one-hundredths or 20 per cent of 100; and ten is 10 per cent; and 5 is 5 per cent. The principle here is the same as that governing the change of common fractions into decimals, which is: "Divide the numerator by the denominator," or "divide the upper figure of a fraction by the lower."

To illustrate let us assume that the annual sales of a certain business amount to $100,000 and that the annual expenses aggregate $25,000. What we want to determine, first, is what percentage of $100,000 is $25,000. To do this we put the figures in the shape of a fraction, and divide the upper figure by the lower, thus:

$$\frac{25{,}000}{100{,}000}$$

25,000.00 / .25

20,000.00

5,000.00

5,000.00

We find, then, that the total yearly expenses of $25,000 represents 25 per cent of the total yearly sales of $100,000. And we know from this that, in making up our selling prices, we must add 25 per cent for expenses, plus whatever margin of profit we desire to make.

Why Anticipated Profits Are Not Realized.

THIS is all apparently simple enough. And yet it does not always work out just right, it seems. Let us see, then, what is it that tangles up so many of us in attempting to handle percentage.

For purposes of illustration, let us take, first, the method of the business man who knows nothing about what his expenses are. He has perhaps heard some other man in the same trade or industry say that he figures to make 10 per cent profit, and because that is what he thinks others are asking, he will figure something like this on a sale, which costs him, say, $20.00.

Cost of goods	$20.00
Add 10 per cent of $20.00 for profit	2.00
Total	$22.00

He will probably mark the goods to sell for $25.00, thinking that the extra $3.00 will cover his overhead expense, and that he will make his 10 per cent profit and perhaps a little over.

Let us see, now, what has really happened:

Cost of goods	$20.00
Expense 25 per cent (not of $20.00 but of $25.00 which will be explained later)	6.25
Total cost	$26.25
Sale price	25.00
Net loss	$ 1.25 or 5 per cent of the selling price.

Next let us illustrate the method of the business man who knows, from last year's figures, that his expenses amount to 25 per cent of his sales, but does not know how to apply that knowledge correctly.

Probably his estimate will show up like this:

Cost of goods	$20.00
Expenses 25 per cent of $20.00	5.00
Profit 10 per cent of $20.00	2.00
Total	$27.00

Let us see what has happened in his case:

Cost of goods	$20.00
Expenses 25 per cent of $27.00 (instead of $20.00)	6.75
Total	$26.75
Sale price	27.00
Net profit	$ 0.25

which is .926 per cent (less than one per cent) of the sale and not 10 per cent.

The differences between actual and anticipated profit, developed in the above illustrations, are due entirely to the fact that two different bases have been used in arriving at the

*Copyright 1922, by G. W. Hafner.

results. In the first instance the percentage of expense of 25 per cent was arrived at by using the sales at selling prices. In the second instance this percentage was applied to the sales at cost prices. This is the error too often made by business men.

Suppose the cost of a given article or commodity is $1.00, and a merchant wishes to add a margin of 33 1/3 per cent to the selling price, how would he figure it? Adding 33 1/3 per cent to the cost will not give the desired result, because:

33 1/3 per cent of $1.00 equals 33 1/3 cents.

$1.00 plus 33 1/3 cents equals $1.33 1-/3, or the selling price.

33 1/3 cents divided by $1.33 1/3 equals 25 per cent.

Hence, instead of earning 33 1/3 per cent on the selling price, as he had planned, the business-man would actually earn 25 per cent only, because different bases were used in the calculation.

The following table gives the equivalent percentage to be applied to cost prices in order to secure a given margin of profit on selling prices.

Desired Per Cent on Selling Prices.	Corresponding Per Cent on Cost Prices.	Desired Per Cent on Selling Prices.	Corresponding Per Cent on Cost Prices.
25	.333	38	.613
26	.351	39	.639
27	.370	40	.666
28	.390	41	.695
29	.410	42	.724
30	.430	43	.754
31	.450	44	.786
32	.471	45	.818
33	.493	46	.852
34	.515	47	.887
35	.538	48	.923
36	.563	49	.961
37	.587	50	100

Rule for Figuring Percentages.

IN this matter of figuring percentages, the very first thing we must get a firm hold on is this: *The sale price represents* 100 *per cent.*

To figure by per cent intelligently we must have somewhere something that represents 100 per cent, which in this case is the SALE PRICE. When we attempt to figure any part of the whole as 100 per cent, we immediately get into difficulty. All component parts are measured as 100ths of this 100 per cent.

Hence,

if expenses represent	25 per cent
and profit represents	10 per cent
we have accounted for	35 per cent
and the cost of the goods must, therefore, represent	65 per cent
making the sale price	100 per cent

In other words, the $20.00 cost of goods is 65 per cent of the sale price, which sale price is represented by the total of 100 per cent.

In figuring percentages of this kind, the following rule must always be observed:

Divide the amount of the cost by the percentage it represents. The answer will be the sale price.

$20.00 divided by 65 per cent equals $30.77 which should be the selling price of the merchandise, provided the price paid for the goods is $20.00, expenses are 25 per cent of the sales, and the dealer wishes to make a profit of 10 per cent net.

How do we know this is correct? A method to be of any value must be susceptible to mathematical proof. Let us therefore prove the proposition thus:

Cost of goods	65 per cent of 30.77	equals	$20.00
Expenses	25 per cent of 30.77	equals	7.69
Profit	10 per cent of 30.77	equals	3.08
Total	100 per cent		$30.77

This method is absolutely correct, whether it is applied to a 50 cent sale or to a $500 sale.

THE SONG OF CHEER.

Songs that are glad and songs that are sad—
We sing as we journey through life—
Songs about mother, songs about dad,
And songs about love, war and strife.

But the song I love on mornings drear,
When the weather is cold and bleak,
Is the song of the steam, so very clear,
As it hisses me from my sleep.

—R. S. T., Fargo, N. D.

AND NINETY DAYS BESIDES, WITH EVERY DAY A BATH A DAY.

An Indiana judge has granted a divorce to a woman who claimed that her husband did not take a bath oftener than once a month. BATH-A-DAY, South Bend, Ind.

HE WAS SO IGNORANT.

He thought a B T U was a competitor of B V D.

C. E. G., Springfield, Mo.

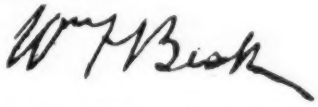
TIT FOR TAT.

Mike was down in the muck making a sewer connection for a doctor's residence. The doctor came out of the house, looked on a moment and said: "That's a mighty poor job you're doing there, Mike."

"Never you mind, Doc," answered Mike. "Sure, and it will be covered up with dirt, the same as many a poor job you've done." H. R., White Plains, N. Y.

A BOMBO READING.

William F. Beck, organizer of the New Jersey Master Plumbers' Association.



This signature plainly shows that its owner has a strong, pleasing personality. He makes friends easily and he keeps them. No man has the betterment of his profession more at heart. He is sincere, and this, along with other gifts makes him a good public speaker. BOMBO.

TRY THIS ONE ON YOUR OUIJA BOARD.

If a man by the name of Henry should marry a widow by the name of Elizabeth, with two small children, what would he have?

A second hand Lizzie and two runabouts.

G. A. H., Clear Lake, Iowa.

A journeyman plumber from Lynn
Knocked the bark all off of his shin.
He didn't dare swear
For his wife was right there.
Now wouldn't you call that a sin?

—B. L., Jackson, Tenn.

IT MUST HAVE BEEN MINCE.

Angry Housewife: "Aren't you the same man I gave a pie to last winter?"

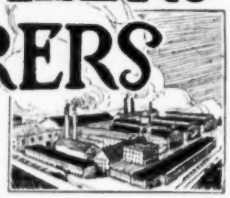
Tramp at the Back Door: "No, mum, I'm not; an' wot's more, the doctors say I never will be the same man again."

R. S. T., Winona, Minn.

As old Jed Prouty used to say, "I don't never sign nothin' I ain't read." So write yours, read 'em, sign 'em and send 'em to Pipe Lines. For, to tip you to a secret, Bombo eats signatures like the sea lions in the zoo eat fish.

A. W. B.

AMONG THE WHOLESALERS AND MANUFACTURERS



NEW LONG ISLAND JOBBING HOUSE.

Ketcham & Van Nostrand, Inc., is the name of a new jobbing house at Flushing, L. I., N. Y. Both Mr. Ketcham and Mr. Van Nostrand have had many years of experience in the plumbing and heating jobbing field. Mr. Ketcham started forty-two years ago with Henry McShane, of Brooklyn, and afterwards bought out that business.

NEW SUPPLY HOUSE IN JENKINTOWN, PA.

Raymond C. Green, formerly with Haines, Jones & Cadbury Co., and R. W. Barcus, formerly head of the heating department of Tomlinson Co., both of Philadelphia, Pa., have opened a plumbing and heating supply house at Jenkintown, Pa., under the name of Barcus & Green.

BOZEMAN MFG. CO. TO MOVE.

Bozeman Mfg. Co., formerly located at 315 Redwood Street, Baltimore, Md., will soon move into new quarters at 1002 Cathedral Street in that city.

JENKINS BROS. TO BUILD FACTORY ADDITION.

Jenkins Bros., of New York City, are having plans prepared for the construction of a large addition to its manufacturing plant in Bridgeport, Conn. The new addition will be modern in every respect and will cost in the neighborhood of $250,000.

IN NEW AND LARGER QUARTERS.

Schley & Nash Co., manufacturer's agents at Pittsburgh, Pa., moved recently to new and larger quarters in the Columbia Bank Building in that city.

LEADER IRON WORKS TO MANUFACTURE STEAM GENERATOR.

The Leader Iron Works, of Decatur, Ill., has recently taken over the manufacture and control of the Freymark steam generator, formerly made by the Freymark Steam Generator Co., of St. Louis.

NATIONAL RADIATOR CO. BUILDS NEW FOUNDRY.

The National Radiator Co., of New Castle, Pa., is adding a one-story foundry to its plant.

CONTINENTAL HEATER CORPORATION EXPANDING.

The Continental Heater Corporation, of Dunkirk, N. Y., is completing a new addition to its foundry, which together with recent additions will increase its capacity more than 50 per cent.

NEW YORK OFFICE IN NEW LOCATION.

The Goetze Gasket & Packing Co., of New Brunswick, N. J., has just moved its office in New York City from 242 Lafayette Street to the Hudson Terminal Building, 50 Church Street. The office is in charge of King & Shepherd.

NEW PLANT TO BE READY DECEMBER 15.

The new plant for the O-E Specialty Mfg. Co. and the Milwaukee Air Power Pump Co., at Humboldt Boulevard and Keefe Avenue, Milwaukee, Wis., will, it is expected, be completed and ready for occupancy December 15th.

FIRE IN EASTERN SUPPLY HOUSE.

The building occupied by the Staten Island Plumbing Supply Co., of Brooklyn, was completely destroyed by fire November 16. The fire was discovered by a watchman who saw flames coming from the upper floor of the building. The damage, estimated at $25,000, was covered by insurance.

NEW COMPANY ORGANIZED AT DETROIT.

Protecto Radiator Mantel Co. is the name of a new company recently organized at Detroit, Mich., to manufacture a combination radiator shield and humidifier. The officers are: C. E. Collins, president; C. R. White, vice-president; G. Vaivio, second vice-president; D. M. White, treasurer, and H. M. Lau, secretary.

CYRUS MARK CALLED BY DEATH.

Cyrus Mark, of the Mark Manufacturing Co., Chicago, died at his home in Evanston, Ill., on Saturday, November 25th, in his 87th year. Two sons and a daughter survive him, one of the sons being Clayton Mark, president of the Mark Manufacturing Co.

J. C. EICHMAN MFG. CO. TO SPECIALIZE IN CLOSET SEATS.

J. C. Eichman Mfg. Co., of Baltimore, Md., is discontinuing its brass department and equipping its entire factory for the manufacture of woodwork, intending to specialize in closet seats. This new arrangement will increase the woodwork production about 100 per cent. The change will be completed by the first of January.

PHILADELPHIA OFFICE ADDS THREE SALESMEN TO ITS FORCE.

Arnold Michelson, manager of the Philadelphia office of the Minneapolis Heat Regulator Co., of Minneapolis, Minn., has just appointed James Shetzsline, Beecher Finch and R. F. O'Brien as sales representatives for this concern. This brings the number of sales representatives traveling out of its Philadelphia office up to seven.

OLD NEW YORK JOBBING HOUSE INSTALLS NEW PRESIDENT.

N. J. Higinbotham has succeeded Abram B. Kolyer as president of the Fred Adee Corporation, of New York, Mr. Kolyer, taking the office of Chairman of the Board. Mr. Higinbotham has been connected, as sales manager and in other important capacities, with several large Manhattan corporations, and it is confidently expected that he will lead the Adee house, which is one of the oldest jobbing concerns in the city, dating from 1866, to still greater prosperity. Mr. Kolyer, who has been with the firm a great many years and is exceedingly popular in the trade, will continue to take an active interest in the business, while gradually passing over the detail work to Mr. Higinbotham.

NEW YORK CHAPTER VISITS RADIATOR PLANT.

The second monthly meeting for this season of the New York Chapter of the American Society of Heating and Ventilating Engineers, was held November 20th at the Bayonne, N. J., plant of the American Radiator Company, Willis H. Carrier, president, presiding.

The party was conveyed in busses to the plant, where members of the chapter inspected the foundry and assembly operations in connection with the manufacture of cast iron radiators, various points of interest being explained by executives of the company.

MICHIGAN PUBLIC HEALTH CONFERENCE.

The Michigan Public Health Association will hold its second annual conference at Lansing, December 4 to 8.

The conference will be largely attended by health officers and nurses, all of whom are deeply interested in sanitation.

Because of this interest, one of the principal speakers will be Professor George C. Whipple, of Harvard University. Professor Whipple is nationally known as a sanitary engineer, and is a member of the firm of Hagen, Whipple & Fuller, consulting engineers, of New York City. Mr. Whipple is now serving as chairman of the sub-committee on plumbing of the Building Code Committee of the United States Department of Commerce.

OTHER SIDE OF THE WORLD HONORS MYERS PUMP EXHIBIT.

The F. E. Myers & Bro. Co., of Ashland, O., exhibited its pumps, some time ago, at the Tokyo Peace Exposition, and received an interesting diploma, decorated in the Japanese style of art, attesting the high character of the goods exhibited and signed by Katano Usami, governor of the prefecture and president of the Tokyo Peace Exposition. This commemorative diploma, which is in English as well as in Japanese, is printed on a shadow background in which vines and doves of peace surround a temple of an ideal style of architecture.

The Myers company reports a constantly increasing trade in the Orient.

PLUMBING, HEATING AND KITCHEN EQUIPMENT SHOWN AT HOTEL EXPOSITION.

Kitchen equipment, heating appliances and plumbing exhibits attracted much attention at the seventh National Hotel Exposition held last week at the Grand Central Palace, New York. The kitchen equipment shown included washing machines and ranges of various kinds. The importance of reliable and smooth-operating sanitary and heating equipment in modern hotels, was discussed by many in attendance.

An executive of one of the leading New York hotels said: "From the viewpoints of both comfort and health, the work of the plumber and the manufacturer of plumbing supplies is of the greatest importance in the operation of the modern hotel. To prove this, one has only to imagine what would happen if plumbing dealers and heating contractors went out of business for twenty-four hours. It would mean disaster. Take away the carpets and all the furniture and we could devise various ways to get along without them, but we could not get along without the bathroom, the kitchen and the boilers."

The following exhibits in the plumbing and heating fields were displayed:

An exhibit, by the W. R. Hughes Co., Inc., New York, of "Enamo" for covering wood, metal or other hard surfaces with a smooth, lustrous and dirt-resisting surface. Various articles such as toilet seats and a half section of a bathroom were shown which had been sprayed with this material, also an exhibit of the sprayers used in this connection.

An exhibit by Leonard-Rooke Co., of Providence, R. I., showing its line of thermostatic water mixing valves, displayed on a velvet background, also a demonstration of its regular shower-mixing valve, connected up with hot and cold running water. F. C. Leonard, C. R. Clark and C. R. Reitzel were in charge of the exhibit.

The Copper & Brass Research Association had two booths, one displaying copper urns and cooking utensils and the other illustrating the difference between the service of copper and iron pipe after years of use. G. A. Sloan, secretary of the association, was in charge of the exhibit.

The Sanitary Bath Curtain Mfg. Co., of New York, showed many kinds and grades of bath curtains, the exhibit being in charge of L. Rosenblum, J. I. Rosenblum and S. Scheff.

An interesting display of silent flush valves with one valve in operation was shown by the Keating Valve Co., Inc., of Springfield, Mass. L. W. Grout, sales manager, W. T. Wilcox and Frank Cobb were in charge.

R. J. Menthe, representing the L. O. Koven & Bro., Jersey City, N. J., exhibited the Koven scullery sink, a solid rim, one-piece kitchen fixture, also a range boiler and stand and a new table with monel metal, acid resisting top.

The West Disinfecting Co., of New York, showed its products, featuring soap devices, paper towels and pipe solvent.

Mitchell S. Little, president of the M. S. Little Manufacturing Co., of Hartford, Conn., has been elected member of the Board of Directors of the Aetna Life Insurance Company, of Hartford, filling the vacancy caused by the recent death of Ex-Senator Morgan Gardner Bulkeley.

A. B. Pierce, vice-president and general manager of the N. O. Nelson Mfg. Co., St. Louis, Mo., sailed from New York Nov. 21 on the Laconia on a pleasure trip around the world. He is accompanied by Mrs. Pierce and a number of friends. The party will visit Havana, Honolulu, Japan, China, India, Egypt and Italy, and will return to New York about March 30, 1923.

Ora C. Cox, of the Mark Manufacturing Co., Chicago, is making an extensive trip through the East calling on the jobbing trade.

Ray Smith, former general sales manager of the E. Stebbins Mfg. Co., Springfield, Mass., has been elected vice-president and general sales manager of that company.

Howard Evans, of Whitney & Ford, Chicago, has been appointed a member of Health Commissioner H. N. Bundesen's newly formed Advisory Smoke Commission, which is to take up the problem of smoke prevention in accordance with suggestions embodied in a report recently presented to the Commissioner by a special committee of the Western Society of Engineers. Meetings of the commission will be held bi-weekly at the City Hall.

F. J. Baker, of Geo. H Tay Co., San Francisco, was in New York City last week on his semi-annual business trip.

A. R. Johnson, of Hays Mfg. Co., Erie, Pa., is in New York for a few weeks calling on the jobbing trade.

Chester W. Fell, of W. A. Case & Sons Mfg. Co., Buffalo, was a business visitor to New York City during the past week.

J. C. Wilson, whose name appeared in this column on November 18, is branch manager of the Kelly & Jones Co.'s Cincinnati branch, and not of the Pittsburgh office, as previously stated.

Louis J. Merkel, of Merkel Bros. Co., Cincinnati, O., was in New York City on a business trip last week.

E. Edwards, of John Simmons Co., New York, has just returned from a week's business trip in the West.

Wm. B. Neal, manager of the Chicago office of the Somerville Iron Works, of Somerville, N. J., has just returned from a Western trip.

L. Bruce Fulton, of the Chicago office of the Standard Sanitary Mfg. Co., of Pittsburgh, Pa., returned last Sunday evening from a several weeks' trip through the Western States. He says that everybody in the West is anticipating a good year next year and that the purchasing for the first three months of 1923 will probably be heavy.

Wm. P. Long, formerly assistant to the manager of the order department of the Detroit Range Boiler & Steel Barrel Co., Detroit, Mich., has been promoted to the position of manager of that department.

Chas. Lipschutz, manufacturers' representative, formerly at 883 Drexel Building, Philadelphia, has taken a larger suite of offices at 892 Drexel Building.

Trade Literature

Plumber's Lead Guide.

The Eagle-Picher Lead Co., Chicago, has endeavored to put into its "Plumber's Lead Guide" all the necessary data regarding lead goods. The many tables and cuts will make it a convenient and useful guide for constant reference.

Earl L. Bortner Mfg. Co.'s Catalog.

The Earl L. Bortner Manufacturing Co., Chicago, has issued its Book No. IV., a 24-page catalog illustrating and describing its seats, hinges, shower fixtures and laundry trays. Throughout the whole book the company emphasizes the fact that "brass is an everlasting material."

Catalog of Drainage Specialties.

The Wade Iron Sanitary Manufacturing Co., of Chicago, is sending out its Catalog "B," a compact, one-hundred page book with 241 illustrations. The catalog is more than usually instructive in that it contains an essay on Plumbing and House Drainage and several pleas for the advancement of the trade.

O-E Specialty Mfg. Co. Bulletins.

The O-E Specialty Manufacturing Co., Milwaukee, Wis., has issued two booklets on its vapor-vacuum pressure system. Bulletin "A" explains the operation of the system, presents the component valves and parts, shows on its center spread a typical pipe plan for a small installation, puts forth the comparative merits of this sort of heating, and prints a number of testimonials and pictures of buildings in which installations have been made. Its successor, Bulletin "B," contains a sketch showing roughing-in dimensions, complete instructions for piping, and gives a number of tables of useful data.

New Envelope Stuffers for Dealers.

Coyne & Delany Co., 828 Kent Ave., Brooklyn, N. Y., "For Your Kiddie!"

Speakman Company, Wilmington, Del., "In Running Water."

The Minneapolis Heat Regulator Company, Minneapolis, "The Heart of the Heating Plant."

The Alliance Vitreous China Co., Alliance, O., "'Avco' Bathroom and Kitchen Accessories."

Clements Mfg. Co., 601 Fulton Street, Chicago, "Save Your Back—with a Cadillac."

"How to Get More Plumbing Business in Dull Seasons."

In connection with its sales contest, the Detroit Range Boiler & Steel Barrel Co., of Detroit, Mich., has issued an attractive 16-page booklet which is brimful of hints to entrants. It covers such subjects as mailing lists and how to prepare them, form and personal letters, newspaper advertising, use of folders, personal demonstrations and window displays.

Twenty Years Ago in "Domestic Engineering"

Saturday, November 29, 1902.

Move Into New Quarters.—The Kennedy Co., of Cleveland, Ohio, has taken the new building at 438-444 Huron St.

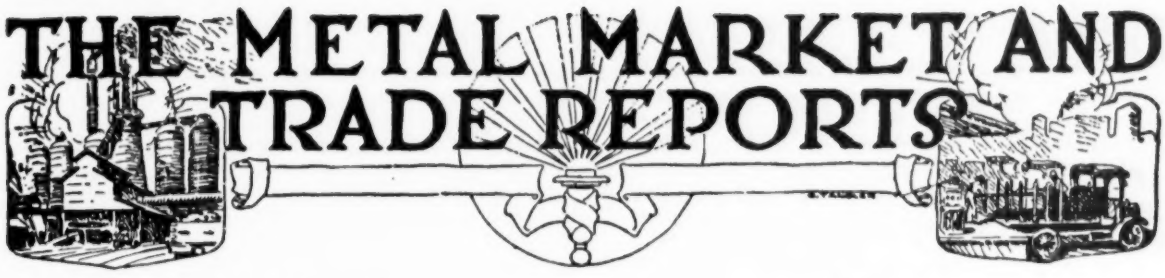
Entertain Russian Representative.—A. Wyckoff & Son, of Elmira, N. Y., have been hosts to a representative of the imperial government of Russia who is studying American products. Wyckoff pipe coverings are to be used in the mills and mines of Russia.

New Form of Sewer Gas.—A St. Louis plumber, who had been called to locate escaping sewer gas, was about to leave his task, unsuccessful, when he happened upon a huge, ill-smelling barrel. Upon raising the lid, the supposed sewer gas escaped. It was a barrel of sauerkraut.

Muskegon Masters Organize.—The Master Plumbers' Association of Muskegon, Mich., was formed last week.

Health Resorts Hit.—A campaign has been started against the large number of diphtheria cases. Physicians declare that the epidemic is traceable to the so-called summer resorts, which are examples of unsanitary conditions.

THE METAL MARKET AND TRADE REPORTS



STEEL AND IRON.

Current demand for light rails has developed mostly into small orders for emergency use and, therefore, for early delivery. This has sent such business to the independent rail makers as the leading interest has no rails for sale for the next six or eight weeks. On the current business a minimum of 2 cents has been ruling. The average, however, has been somewhat better than this, attractive business having been placed at 2.15 cents and some mills taking in competitive orders at 2.10 cents.

The sale of rerollers, taken from old standard section rails, and rolled down to the lighter weight, has been somewhat more encouraging as coal mines and others using these sections are turning almost anywhere for quick delivery. This trade is based on a 2-cent rate.

In the Ferro-Alloy Market.

In the ferro-alloy market there were many signs of increasing interest and buying last week. Some of the steel interests at Pittsburgh have been protecting their needs with sizable orders, ranging from 100 to 2,000 tons, and these are now booked by domestic producers at $100. Talk of advancing prices for English material has caused some consternation in the trade as the Turkish upheaval has cut off Caucasian ores. It will not be surprising to see the alloy market in so far as manganese is concerned considerably higher.

Sheet Metal.

In spite of the fact that one or two independent sheet firms have made concessions for forward business on black sheets by taking business at 3.25 cents, the general tone of the sheet market appears firm and unshaken at 3.35 cents with some independents still adhering to the 3.50 cent base. It is claimed by many of the sheet makers that they can not get down to the 3.35 cent base with bars holding to $38 and the trade, therefore, is slow to take on tonnage until a thorough combing of the sheet bar market has taken place.

Tin Plate.

There is much talk of an advance of 25 cents a box on tinplate for the first quarter of 1923. No definite announcement is expected, however, until after December 1.

The steel trade is generally satisfied with the action of the Steel Corporation in reaffirming present prices on sheets and tinplate for the first half of 1923. On sheets, however, the independent steel companies are not inclined to follow the lead of the corporation, particularly in the blue annealed sheets. The corporation's price is 2.50 cents, but it is reported that it is so far behind in deliveries of fourth quarter material that 75 per cent of these orders will carry over into next year. Accordingly it would not be surprising if independents advanced first quarter prices to 2.75 cents.

So far the independents are not quoting prices beyond January, and then only when linked up with December delivery. Their sheet prices are down to corporation levels except in blue annealed sheets, usually sold at 2.60 cents.

Steel Billets.

New York steel company representatives have done good business of late in billets, which sell at $38 for 4x4-inch rerolling quality. Forging billets sell from $45 to $49 per ton.

Pig Iron.

The pig iron market continues practically stagnant, inquiry being very light. The market is sagging from week to week, one or two inquiries being frequently sufficient to produce enough competition to lower prices.

Sheet Bars, Billets and Slabs.

First quarter needs for sheet bars, billets and slabs are being inquired for quietly. While sales are made by one northern Ohio interest at $38, Youngstown, other producers still maintain a nominal quotation of $40. Such mills have no tonnage available for shipment this year and they are not ready for first quarter bookings. Trade authorities believe that at present if any lower prices than $38, Youngstown, are available the minimum would be $37.50, and then only in large tonnages. Forging billets have sold in lots up to 200 tons each and as high as $47.50, Pittsburgh. As low as $42.56, however, has been quoted by one interest in Pittsburgh.

Eastern Pennsylvania furnaces are making a strong fight to keep the market price up to $29 base. On the surface of things this still appears to be the market, but notwithstanding big buyers have been offered iron at $28, at least one furnace is reported as willing to sell at this figure.

Numbers of inquiries for lots of 200 to 500 tons for Southern consumption were in the market at Birmingham, indicating the revived interest of the average consumer in both immediate and first quarter iron supply. The Eastern pipe makers are inquiring for a total of more than 30,000 tons. Actual sales involving large tonnages are generally expected by the first of the month. Another 1,000-ton lot for Southern consumption brought $23, which is now regarded as the open market base.

Prices for pig iron are quoted as follows:

No. 2 foundry, Pittsburgh	$28.77@$29.77
No. 2X, Eastern Penn., Philadelphia	30.14@ 31.14
No. IX, Buffalo	29.00
No. 2 Southern, Birmingham	23.00@ 24.00
No. 2 foundry, Chicago furnace	29.00@ 30.00
Basic valley, furnace	27.00@ 28.00
Bessemer, Pittsburgh	33.77@ 34.77

* * * *

Copper.

Though it is difficult to judge the situation in copper by surveying a short period of time it would seem as though the latter part of the week buying had fallen off. Had purchasing continued at the rate of ten days ago the 14-cent price would probably be uniform at this time. However, the bulk of the business is done at 13⅞ cents. Though copper has definitely firmed from 13¾ cents to 13⅞ cents, consumers show no alarm over prospects of higher prices and are taking their own time in entering.

October statistics, which showed shipments of 25,000,000 pounds more than production for the month, have resulted in optimistic feeling among producers, and, taking a broad and long-period view, conditions are satisfactory.

Though a well-posted automobile engineer in Detroit estimated that the automobile industry would consume 50,000,600 pounds of copper in 1922, the Copper and Brass Research Association has estimated just double this consumption.

Tin.

Tin has yielded the center of the stage among the nonferrous metal markets to zinc. Tin prices were virtually unchanged, and for the first time in many weeks there was no variation from the day before at London in either spot standard or spot Straits tin. Standard futures declined 2s 6d. Prices for Straits tin in New York were 36 cents per pound for spot and 36¼ cents for January, February, etc. Intensifying the present stability of tin was sterling exchange, which was unchanged at $4.495. The position of tin looks bad for the bulls because of the 9,260 tons afloat and arrivals of 4,000 so far this month.

Lead.

The American Smelting & Refining Company on November 24th advanced the price of lead $2 per ton to 7.10 cents per pound, New York, and 6.90 cents East St. Louis.

On the strength of the advance brokers who had prompt metal in New York were quoting as high as 7½ cents per pound, asking 7¼ cents for futures. The high prices in the outside market had been caused by bad transportation conditions rather than by heavy demand.

Zinc.

For the third day in succession, zinc prices receded $2 per ton to 6.85 cents to 6.90 cents, East St. Louis. Zinc was offered as low as 6.80 cents and for a time difficulty of disposing of it was encountered. The American market has evidently been leaning almost entirely on the London market. The halt in the declines at London evidently caused the same action here.

Other Metals.

Quotations on other metals in New York are as follows:
Aluminum in 50-ton lots, 99% and purer....22.00 cents per lb.
Antimony, Chinese brands..... 6.45 cents per lb.

New York Old Metal Market.

The following prices are current for old metals:

	Buying	Selling
Copper, crucible	12 to 12¼ cents	12¾ cents
Copper, light	9¾ to 10¼ cents	10½ cents
Brass, heavy	**6¼ to 6¾ cents**	**7 cents**
Lead, heavy	5¾ to 6¼ cents	6½ cents
Tea lead	4¼ to 4¾ cents	5 cents
Cocks and Faucets	7½ to 8 cents	8½ cents
Solder Joints	8 to 8½ cents	9 cents
Zinc, new scrap	5¼ to 5¾ cents	6 cents

Chicago Old Metal Market.

The following are the current prices for old metals:

	Buying	Selling
Crucible copper	11½ to 12 cents	12¼ cents
Heavy copper and wire	**11¼ to 11½ cents**	**11¾ cents**
Light copper	9½ to 10 cents	10½ cents
Red brass	**8¾ to 9 cents**	**9¼ cents**
New brass clippings	**8¼ to 8¾ cents**	**8⅞ cents**
Heavy yellow brass	**6½ to 6¾ cents**	**7 cents**
Light brass	**5½ to 6 cents**	**6¼ cents**
Heavy lead	5¼ to 5¾ cents	6 cents
Tea lead	3½ to 4 cents	4½ cents
Zinc	3¾ to 4 cents	4½ cents
Block tin pipe	31 to 32 cents	32½ cents

IN THE CHICAGO SUPPLY MARKET.

Prosperity—Strikes—Rents—No Radical Change.

Chicago, November 29.—The colder weather, presaging the approach of winter, sent a shiver of apprehension through the plumbing and heating supply market and allied industries. Coal, which has not been any too abundant for some months, will be in still greater demand with the coming of cold weather with its train of effects, one of which will doubtless be the tightening up of transportation. With a clear vision of the situation, all manufacturers and jobbers are girding themselves for the impact of a still greater tie-up, and are bracing themselves against an increasing demand, if this should occur.

Predictions of Prosperity.

That there is, however, a long period of prosperity ahead in the plumbing and heating fields, is the opinion of many whose judgments should be worth listening to. One of these views the situation as follows:

"People are demanding in the new residential and apartment buildings the latest in plumbing and heating. Some people that are now living in cold-water flats, are not content, when moving, with merely parquet floors, electric light equipment and hot water plumbing. They also want modern heat and every plumbing accessory that will add to their comfort. In order to obtain these improvements, they are willing to pay any rent."

Are Rents Going Up?

In his opinion, after April 1, 1923, instead of rents coming down, they will go up, with the result, perhaps temporarily, that building will show a decline. Further, prices of building materials are going up instead of coming down, he thinks. The advance in prices in some lines and a recent increase in wages of $1.75 per day in certain trades, will also have its effect on building operations.

The uncertainty in the outlook for the future, has, however, had some peculiar and interesting effects upon plumbing and heating and others trades in the construction field. One builder, for instance, cancelled over twenty heating plant orders last summer, expecting lower prices. Instead of lower prices, there was an advance of 10 per cent on boilers and 5 per cent on radiation. He did not want to reinstate, in spite of the fact that deliveries were running behind, still hoping for a decline. Then there was another 7½ per cent advance in radiation and a 10 per cent advance on boilers. He continued to hang on, however, taking a gambler's chance, thinking that something would happen.

At the beginning of fall he was willing to reinstate his orders, and he did so. The result was that the equipment came all together in one day, whereas he had made arrangements for handling them only two or three at a time. He was compelled, however, in order to be sure of having them when he wanted them, to take them all at once. The demand was so great that the only way he could feel safe was to take them when he had the opportunity.

"The time has gone," said one jobber, in commenting upon this circumstance, "when a supply man has to hold the bag for the contractor or building operator."

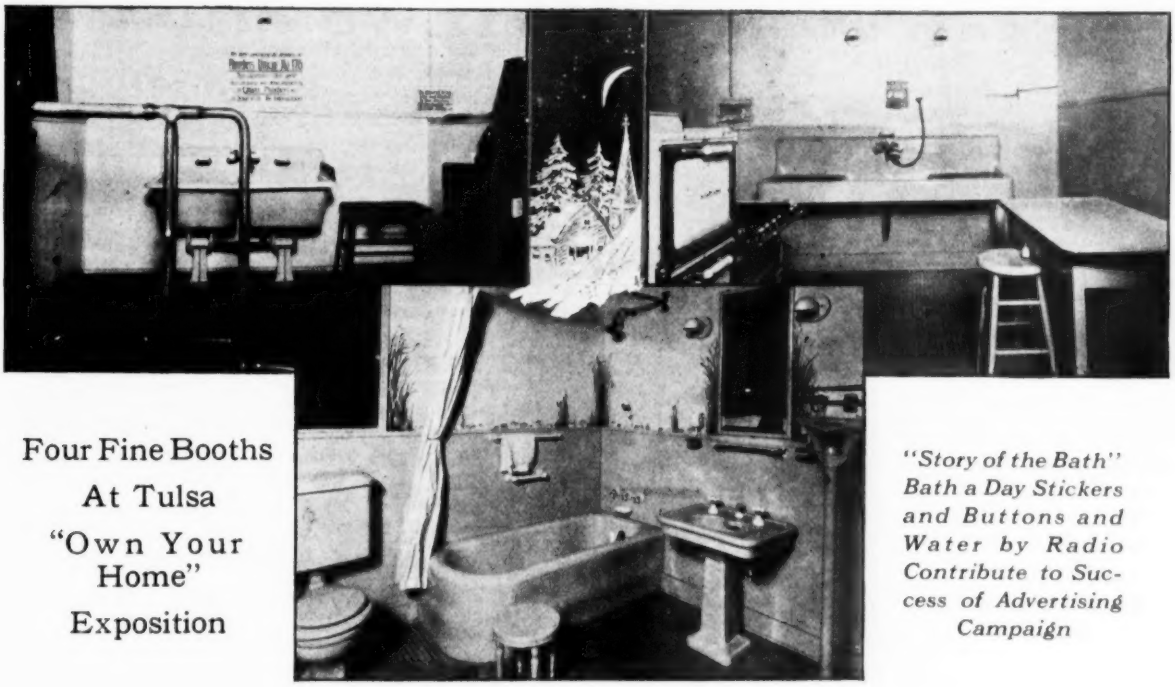
One jobber, in commenting on the outlook in the plumbing and heating trades, expresses the opinion that there is little doubt that if the building boom is not handicapped by artificial restrictions, the demand will continue indefinitely. The income of the workers should, therefore, remain high, and it is not unlikely that the Landis award scale may be raised.

Faint rumblings are heard in the distance of a falling off in price in some commodities. If this indicates a falling off in construction, the amount will probably not be appreciable in the face of the present insistent demand. The approach of colder weather, which has affected the demand for soil pipe, has greatly increased the demand for supplies for heating plants.

Pottery.

Many plants are attempting to work toward the operation of their plants with unskilled labor. Some plants, of course, have accomplished but very little to date. Other plants claim to have reached 50 per cent production with the unskilled workers. There does not seem to be any different attitude on either side to make any compromise proposition. Both the manufacturers and the men seem determined to fight this out to a finish.

(Continued on Page 401.)



Four Fine Booths At Tulsa "Own Your Home" Exposition

"Story of the Bath" Bath a Day Stickers and Buttons and Water by Radio Contribute to Success of Advertising Campaign

ONE booth was a place to rest. That alone would prove that the Society of Sanitary and Heating Constructing Engineers of Tulsa, Okla., who staged the four booth exhibit at the "Own Your Home" Exposition, held in that city October 30 to November 4, knew how to do it right. That a person is in a much more receptive mood while resting, is a fact that is used with good effect by many sales agencies. If a prospect gets tired bodily, he will also get tired of the idea of buying, which at first gave him satisfaction.

"The Story of the Bath," Bath a Day buttons and stickers as well as other literature was also kept in the rest room for the benefit of the guests of the exhibit. A mystery faucet which emitted water, which apparently came from nowhere, excited the curiosity of the spectators. Curiosity is among the strongest advertising appeals. The faucet was attached to a radio outfit set on top of the "Rest" booth. The faucet bore the sign "Spavinaw Water by Radio," which attracted the attention of Tulsa residents owing to the fact that Tulsa has recently voted bonds of nearly seven million dollars to bring water from the Spavinaw River.

The second booth had a complete bathroom equipment with a built-in tub, pedestal lavatory, mirrors, dental lavatory, scales, bath stools, towel bars, shelves, closet, shower bath, toothbrush holders etc.

Booth No. 3 was fitted up as a kitchen with a double drainboard apron sink with combination faucet and spray, drainboard mats, kitchen stove, table and stools.

Booth No. 4 represented a basement or laundry room with an automatic Ruud heater, laundry tray and a complete job of roughing in work which was done by local union No. 176, members of which also helped to explain interesting features of the exhibit to visitors.

These advertising booths were a business as well as an artistic success.

Eighteen Years of Building

A Survey of Twenty Cities

AT THE suggestion of the E. Stebbins Mfg. Co., Springfield, Mass., a man, well known as a statistician, has made a study of domestic building in twenty leading cities throughout the country for the last eighteen years. Taking for granted that these cities represent the whole country, the facts brought out by this investigation apply to every state and every city.

A summary of the results shows the following:

In the years of 1905 to 1908, the building of new domestic constructions was far below the average.

Between 1908 and 1912, there was a gain in building just enough above the average to even up the slump in the four preceding years.

From 1912 until 1922, the amount of domestic building was at all times greatly below the average, although the years of 1915 and 1921 stand out as almost normal.

The present year, 1922, as we all know, has been the best in the last eighteen from the point of view of building activity.

Looking at this period, we find that five years have been above normal, while thirteen have been under normal. The lean years, therefore, have been far in excess of the fat ones, both in number and degree of building.

If we were to have five more years like the present one, then the account would be balanced, and would make at the same time allowance for fire losses and natural depreciation.

So, contractors and dealers, we may have before us five such years of general plenty as have never been known in the plumbing and heating business. Are you ready to meet with them?

With DEALERS and CONTRACTORS NEWS and VIEWS

VENTILATOR TESTS AND CENTRAL HEATING PLANTS DISCUSSED AT KANSAS CITY.

The November meeting of the Kansas City, Mo., Chapter of the American Society of Heating and Ventilating engineers was held at the Kansas City Club recently, with President R. M. Stackhouse presiding.

President Jay R. McColl and Secretary C. W. Obert, of the parent society, were guests of the chapter, and gave short talks on the activities of the Research Bureau, mentioning the "equal comfort investigation" now being carried on. David Caleb, of the Kansas City Power & Light Company, spoke on "Heating of Buildings from a Central Plant," and Professor Calderwood, of the Kansas State Agricultural College, described tests on ventilators, which have been carried on at the university.

SOUTHERN ILLINOIS PLUMBING DEALERS MEET AT CARBONDALE.

At a district convention of the plumbing dealers and heating contractors of Southern Illinois, held at Carbondale, Ill., I. C. Greenberg, of the Trade Extension Bureau, was the principal speaker. Wm. Bergner, of Granite City and Mr. Wolff, of Carbondale, were also in attendance and spoke along business lines. About fifty members from Southern Illinois were present.

"The reason for failure is that too many business men do not know the fine art of business," said Mr. Greenberg. "In order to do business, you must understand business. We must realize once for all, that business is service. We plumbing dealers and heating contractors, have a most necessary service to render mankind. Health, sanitation and warmth are three services that man cannot live without. This kind of service must be done in a manner that is certain and complete. In order that right service may be rendered, cheap, slip-shod goods must be eliminated. Good mechanical skill coupled with unworthy goods is not right. You cannot afford to wrap up your reputation in a cheap job that will not render service and satisfaction. You lose your reputation as well as a customer. Profit lies in service, not in goods.

"You as well as other business men are really teachers who teach the public what they really need," Mr. Greenberg said in conclusion.

SANITATION IS GAUGE TO WORLD PROGRESS, W. G. ARCHER TELLS JOHNSTOWN, PA., PLUMBERS.

"The big thing in this business is to dignify it, and the way to dignify it is to get it before the public; and the way to get it before the public is through your own newspaper," declared W. G. Archer of the National Trade Extension Bureau, in an address before the Master Plumbers' Association of Johnstown, Pa., recently. More than fifty of the master plumbers and steam fitters, in addition to several local business men, were present, and while Mr. Archer's talk was devoted largely to the plumbing trade, the trade truths expounded could not help proving of benefit to any line of business.

The special guests at the banquet included George B. Stewart, president of the Pennsylvania state association; H. R. Wicks, state secretary, and William Johnson, all of Pittsburgh. Mr. Johnson is a former citizen of Johnstown, having been a member of the plumbing firm of Ringler & Johnson, years ago. The toastmaster of the evening was John R. Flinn, president of the Johnstown association. State President Stewart was called upon for a few remarks, in which he gave an outline of the activities of the state and national associations and told of the reasons for the association, its benefits and its purposes.

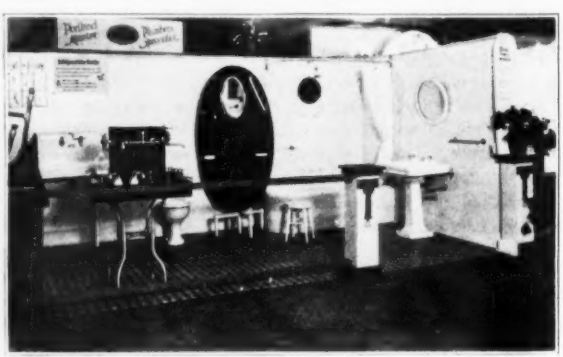
MASTER PLUMBERS OF ATLANTIC CITY STUDY JOBBING METHODS AND MANUFACTURING PROCESSES IN PHILADELPHIA.

Atlantic City is to be congratulated on the progressiveness of its architects and master plumbers. Recently a number of them organized themselves into a body to inspect personally the processes and methods used in the manufacture of sanitary plumbing and to study, at close range, the warehousing and shipping problems of the big jobbing houses.

Twenty in all left Atlantic City for Philadelphia. By courtesy of the Philadelphia & Reading Railway Co. a special car was chartered. This score of seasoned business men undertook the trip very much in the spirit of young engineering students on a visit to a big manufacturing plant, and a distinctly youthful spirit of enthusiasm possessed the crowd.

When Philadelphia was reached a fleet of Quaker City taxicabs was commandeered and instructed to drive to the Hajoca Brass Works, where the party was cordially welcomed by J. Harvey Borton, president and general manager, and Karl Legner, vice-president, and arrangements were made for an immediate inspection of the brass works.

This plant has never been so busy in its sixty-four years of work as at the present, and the visitors had an unusual



The Exhibit of the Portland Master Plumbers' Association at the Oregon Health Show, Held in Portland, Oregon, October 28 to November 4, 1922.

opportunity to inspect every nook of the factory. Many intricate details of manufacture were shown and described in an interesting way and the work of the machines inspected.

The electric furnace was an object of special interest which incited a rapid fire of questions by the visitors and equally rapid replies by the superintendent. A little over two hours was spent in this inspection and each process, from the feeding of pure copper ingots into the furnace, the pneumatic making of molds, etc., down to the final inspection and wrapping of the finished product, gave the visitors information and facts that will prove useful in their future sales work.

The warehouses, pipe sheds, and yard were also inspected and several of the party took further interest in the work of the order fillers and shippers and got an idea of how an order is put through from its receipt to its shipment.

After a buffet luncheon at noon the visitors left in eight touring cars for Norristown, Pa., to visit the Hajoca Iron Works, where they learned a great deal about soil pipe.

The evening was spent at the Manufacturers' Club, Philadelphia, where Mr. Borton and Mr. Legner were hosts to the visitors. A profitable day and a most enjoyable evening was the verdict of the visitors when they boarded the train for home.

The personnel of the party was: David Moore, Richard Hillyard, of Frank Walsh Co.; William Ferguson, of Currie Co.; Walter Jarman, Alexander McKay, James Hardcastle, Harry Moore, Frederick Sharp, Norris L. Gaskill, Curtis Frambes, George Whitson, James Tindaro, and Oscar Schmidt, of Atlantic City; Messrs. Chadwick, Ocean City, and Mr. Hunt, of Hunt & Wilson, Pleasantville, N. J.

SOUTHERN CALIFORNIA SANITARY DEVELOPMENT LEAGUE PROMISING.

The activity of any month old organization which has made itself felt in so many ways as has the Southern California Sanitary Development League is bound to be watched with interest. This league has already reached thousands through a publicity campaign, has several active, well-organized committees, and has given much inspiration to its members.

At the last meeting of the league, at the Palais Royale, Los Angeles, Calif., there were 105 members present, including many new faces not seen at the organization meeting. The occasion was a banquet and entertainment. The chief speaker of the evening was Edward F. Trefz, whose subject was "An Inside Job." He sought to show that co-operation must come from within the organization, and spread outward.

"Advertising," said Mr. Trefz, "is nothing more than a continued, insistent course of teaching the public. By advertising, you can change the taste of the public, but you cannot change the public until you perfect your own work. You cannot do this until you perfect yourself and your organization."

Mr. Trefz said that there was no trade that had been ridiculed more than the plumbers,' and that members of the league must, through their own efforts, train the public to look upon plumbers not as a joke, but as persons to be respected.

The executive committee reported on organization, publicity, and membership campaigns. About thirty new members were received into the league membership. Henry R. Boynton, 826 Higgins Building, was appointed executive secretary.

In his opening talk, President A. R. Benedict expressed the keynote of the evening as follows:

"Since modern sanitation had its inception, many years ago, infant mortality in the United States dropped from 17 to 3 per cent, and this tremendous saving of lives is directly

"Built Right to Stay Tight"

LAVIGNE
PACKLESS STEAM RADIATOR VALVES

TO the steam fitter who prides himself on the perfection of his heating installations, radiator valves are of the utmost importance—because the success of a heating system depends to a great extent upon the valve operation. That is why Lavigne Packless Quick Opening Steam Radiator Valves are the first choice of those who know.

They are leak proof, fool proof and attractive in design. Our complete range of styles and sizes satisfies every requirement for Vapor, Vacuum, Central Station or Low Pressure Steam Heating Systems.

COMMONWEALTH BRASS CORPORATION
DETROIT

Also manufacturers of a complete line of high-grade Steam and Hot Water Radiator Valves in all standard sizes and patterns

Your Jobber can supply you

Every Essential for Highest Efficiency is embodied in

WILKS Water Heaters

The advantages of steel heaters over cast iron are too well known to require emphasis.

WILKS Heaters are constructed of best quality steel, strongly riveted and calked. Will not crack or leak. Water circulates in vertical direction—the natural way for heat to move water.

Made in a wide range of sizes—from the small surface burners to large self-feeding type. You'll find them suitable for any job.

Write for catalog covering the WILKS line of Water Heaters, Garbage Burners, Garage Heaters, and Steel Tanks for Every Purpose.

S. WILKS MFG. CO.
3517 Shields Avenue, Chicago, Ill.
EDWIN W. SEDGWICK, President
HARRY M. SEDGWICK, Sec. and Treas.

At Last!

A SINGLE PIPE VAPOR SYSTEM

Simple to Install
Efficient in Operation
Low in Cost

Descriptive matter sent on request

GORTON & LIDGERWOOD CO.
96 Liberty Street, New York
FISHER BLDG., CHICAGO, ILL.

look for the mark

QUICK-PRESSION
TRADE MARK PATENTED

BE sure you are getting the genuine, made only by us, the full-opening-with-quarter-turn mechanism. It costs no more and you can depend on it.

It's always branded QUICK-PRESSION

The CENTRAL BRASS MFG. CO. of CLEVELAND
"There's no substitute for QUALITY"

traceable almost entirely to our modern plumber. It is through presenting such facts to the public that the Southern California Sanitary Development League plans to place its honorable and very necessary profession where it rightfully belongs in public esteem."

NOTES FROM THE WOMEN'S AUXILIARY.

Mrs. E. D. Hornbrook, of Kansas City, Mo., president of the Women's Auxiliary, has been working most untiringly in behalf of "The Story of the Bath." She made a special trip to Tulsa, Okla., in order to put the story before the Tulsa Board of Education. Mrs. Hornbrook states that on her trip to some of the outlying towns of Oklahoma she found plumbing conditions to be most deplorably insanitary. Mrs. Hornbrook has already placed "The Story of the Bath" in the schools of Manhattan, Kans.

The Women's Auxiliary Association of Master Plumbers of Kansas City held its yearly dance and card party on November 23rd at the E. D. Hornbrook home. The Hornbrooks will also act as hosts at the Auxiliary's annual home coming during the week of December 25th.

RENO MASTER PLUMBERS WORKING ON CODE.

The Reno Master Plumbers' Association, Reno, Nevada, has moved to more suitable rooms at 227 N. Virginia Street. They are at present working on a state plumbing code to be put before the state legislature this fall.

A NEW PLUMBING AND HEATING COMPANY IN DENVER.

The Mowbray-Garretson Plumbing & Heating Company is the name of a new Denver concern now doing business at 2055 Champa Street. Fred Mowbray, a member of the firm, was formerly in the plumbing business at 14 East Sixteenth Street, Denver.

PLUMBERS' LICENSE LAW ATTACKED.

The Colorado law relating to the licensing of plumbers will not hold water, according to the decision of County Judge W. Dunn, sitting in Littleton, Colo., a small town ten miles south of Denver. He ruled last week that the legislative act, giving the state board of plumbing inspectors the power to issue or deny licenses to plumbers, is unconstitutional.

The opinion was given in the case of the state plumbing board against James E. Rogers, of Littleton, charged with practicing the trade without a license. Supporting a demurrer to the charges, Attorney L. J. Kavanaugh, of Denver, attacked the legislative act, declaring it created a monopoly. The court sustained his contention that too much power is now delegated to the inspection board.

ALLEGED OBNOXIOUS PRACTICES FIGURE IN HISTORY OF NEW YORK BUILDING TRADES COUNCIL.

The Building Trades Council of New York City was recently outlawed by the Building Trades department of the American Federation of Labor because of its alleged obnoxious practices. Patrick Crowley, who has been president of the Building Trades Council since Robert P. Brundell was sent to Sing Sing prison for extortion, has resigned.

The members of several crafts including the master plumbers, are said to have quit the council because of this action of the Federation, and may form a new council to be organized by the Building Trades department of the American Federation of Labor.

The Exhibit of the Humphrey Co., of Kalamazoo, Mich., at the Recent Annual Convention of the American Gas Association, Held in Atlantic City, N. J.

SOUTHERN ILLINOIS LEAGUE HEARS GREENBERG.

The Southern Illinois League of Master Plumbers held one of the best meetings so far in its history on November 15, when it met at Carbondale to hear Mr. Greenberg, of The National Trade Extension Bureau. Dinner was served to fifty-seven members.

RECORD BREAKING BUILDING IN ATLANTA.

While construction over the entire South has reached the highest point in the history of Dixie, figures by the building inspector of Atlanta, Ga., are more inspiring than in any other southern city. With one or two exceptions, each month has established new records for all time in Atlanta. The October total was above $2,600,000, the largest month in this regard in the twenty-seven years since the inspector's office was established. The end of October found Atlanta figures more than $3,000,000 larger for the first ten months than any previous record in the city's history for an entire year. Value to November 1st was almost $17,000,000, the previous record being in 1920, when the total for the year was $13,372,666. During the first eighteen days of November the total permits in valuation exceeded $1,000,000.

A BATH A DAY FOR EVERYBODY.

Courtney Armstrong, plumbing dealer at Knightstown, Ind., is carrying the gospel of a bath a day into every home in his community. He has presented copies of "The Story of the Bath" to members of the Kiwanis Club and the schools for supplementary reading. He also has Bath a Day signs on his windows, uses the slogan in his newspaper advertising, sticks stickers on his envelopes, and has the school children wearing Bath a Day buttons. Mr. Armstrong believes in selling more plumbing by selling comfort, health and convenience, the things people want and buy.

BUILDING ACTIVE IN DETROIT—SLOWING UP IN NEW ENGLAND.

Building activity in Detroit shows no signs of easing off despite the approach of winter months, according to a summary prepared by the Builders and Traders' Exchange. The total of new work listed showed an increase over the weeks previous, and there is every indication that building will continue steadily in Detroit for some time to come. On the other hand, building in New England is slowing up, which is natural at this time of the year, but enough work is in progress to indicate unusually large operations this winter.

Capitol Products
Always Satisfy

CAPITOL
Radiator Valves

have been a standard for twenty-five years. Made in Packless and Standard type, also Hot Water Valves and Union Ells. A better valve cannot be produced.

We make a complete line of Steam Valves, Engine and Boiler Trimmings, Bath Cocks, Basin Cocks and Plumbers Brass Goods.

Our goods are made to give service.

Combination Sink Bibb

No. 421—*Patent Applied for*

Our plumbing fixtures are made of a high grade steam metal composition, consisting of only the highest grade virgin metals, and have an extra heavy coating of hard nickel, on high grade metal, giving a superior finish, and will last a life time if properly taken care of.

All plumbing fixtures have duplex seats that are indestructible.

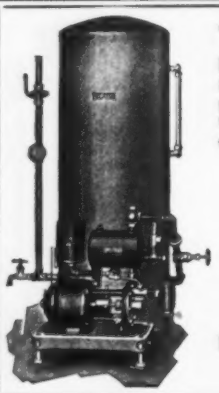
Combination Laundry Tray Bibb, when desired, furnished with union, also bracket to wall.

Write for Catalog No. 11

CAPITOL BRASS WORKS
Detroit, Michigan

"XPDNC"
Reverse Trap
XPDNC Reverse Trap Closet of latest design embodies the newest ideas in Reverse Trap construction.
It is offered where a powerful working, cleverly designed closet of this type is desired.
Ask your nearest Jobber for it.
Made of Castex Whitest Vitrified China

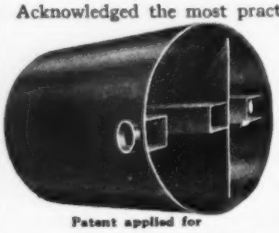
CHICAGO POTTERY CO.
1924-40 CLYBOURN. AVE. CHICAGO. ILL.



THE BURKS PUMP
has been developed to meet the insistent demand for a high grade dependable pump of this type, one capable of continuous operation against high pressures
MECHANICALLY PERFECT AND FOOL PROOF
Incorporated in all
DECATUR
Residence Water Systems
Write for complete catalog and prices
DECATUR PUMP COMPANY
Sole Manufacturers
Decatur, Illinois

Beggs Flush Valve
Quality
Class
Positive
Unquestionable
Noiseless
None Like It
BEGGS ENGINEERING CO.
HARTFORD, CONN.

RECO SEPTIC TANK
Acknowledged the most practical Septic Tank manufactured. Why?



Patent applied for

It is light and easy to handle which means low installation cost.
The freight rate is low.
Made of an alloy copper-steel protected by an acid-proof enamel which insures long wearing qualities.
Made of metal, it is watertight and gives better bacterial action than a concrete tank that is not watertight.

Ask your plumbing jobber or write
RICHMOND ENGINEERING COMPANY
930 Brook Ave., Richmond, Va.

OLD HOTEL TO BE RAZED FOR MODERN FIFTEEN-STORY HOSTELRY.

Several Large Plumbing and Heating Contracts Awarded.

The old Arlington hotel of Memphis, Tenn., has been closed and will soon be torn down. In a few months the new Tri-States hotel, fifteen stories in height, will rise in its place. The heating and ventilating for this new building has been awarded to the Hughes Heating Co. and the plumbing contract to the J. W. Hill Plumbing & Heating Co.

Other recent contracts in Memphis are for the installation of heating equipment in the new ten-story Shrine building, which will be done by the Fischer Heating Co. The plumbing is to be done by Pritchard Bros.

Mee & Heisler are doing the plumbing on the Goldsmith department store annex.

HEALTH AUTHORITIES MAY TAKE CONTROL OF PLUMBING CODE.

A measure proposing that the health authorities of the city of Toledo, Ohio, be given the power to compel property owners to install sanitary plumbing, was presented to the city council recently. Although it was approved by a committee, it failed to pass, and will be brought up again in new form.

Some time ago the council passed an ordinance with practically the same provisions, but it was vetoed by the mayor, who said he did not believe the measure would stand in the courts.

The new ordinance, which was drafted by the city's legal department, differs from the original ordinance in that the city health department would take steps to install plumbing where it saw fit instead of leaving it to the property owners to make application for the improvement.

"BATH A DAY" ENTHUSIAST GOES TO NEW POSITION.

Regret is expressed in Canadian plumbing circles over the fact that Harry L. Glendenning, for the last two years manager in Toronto for the Standard Sanitary Manufacturing Co., has given up that position to assume the business management of the Northern Ontario Relief Committee, an organization formed since the recent big forest fires in that section of Ontario, to administer relief. The new position will require all his time. Mr. Glendenning's business associations have been chiefly in the sanitary field, having been with the J. L. Mott Iron Works, Chicago branch, from where he came to Canada ten years ago. For six years he was sales manager of the James Robertson Co., and for the last two years has been with Standard Sanitary Mfg. Co. Mr. Glendenning was a popular figure in the sporting world prior to entering the plumbing business, having played professional baseball with Kansas City in the Western League, later going to the National League and playing with the Chicago Cubs for over a year. He is an enthusiast for the "Bath a Day" idea, and the Standard Sanitary Mfg. Co. was one of the first to prominently display this slogan in Canada.

FIVE DOLLARS AND A SUIT OF CLOTHES FOR STEALING A BATHTUB.

An Oklahoma City man stole a bathtub. He was convicted of the charge and sent to penitentiary,—term of sentence one day. If the custom of the penitentiary authorities is followed, the bathtub thief will get five dollars in cash and a suit of clothes on leaving that institution. Also, if he behaves while in confinement, he will receive the regular time off for good conduct which would reduce his sentence to eighteen hours.

TILED BATHROOM FOR CATTLE AT KANSAS CITY EXHIBIT.

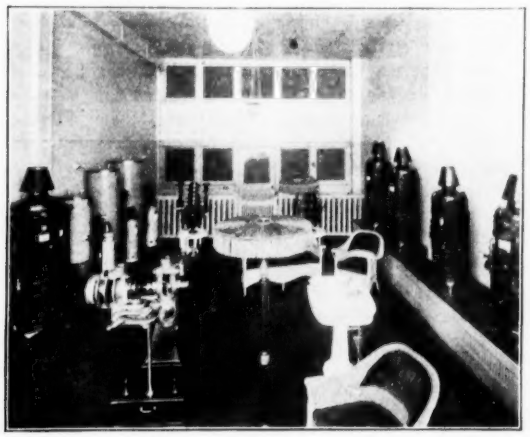
No longer will the Herefords, Shorthorns and other cattle brought to Kansas City for exhibit, be obliged to stand before an open-air wash rack and have their baths given them from a hose, for at the new Royal building, where the annual exhibit is held, this antiquated form of shower bath has been done away with, and the pure-bred cattle are to have a tiled bathroom, where they may take their baths before appearing at the show.

The bathroom has a concrete floor, is finished with red Flemish tile, and is located near the heating plant so that there may always be plenty of warm water. A set of ten showers has been installed, and the cattle will have only a few feet to walk from their stalls to the bathroom, whence they will emerge with their coats nicely marcelled, all ready for exhibition.

The animals seem to enjoy their baths and the tempered water is considered less hazardous.

RUUD MFG. CO. IN LARGER QUARTERS IN KANSAS CITY.

The Ruud Manufacturing Company, of Pittsburgh, Pa., has recently enlarged and remodeled its branch house on Main Street, in Kansas City, Mo. A view of the new display is



The Showroom of the Ruud Mfg. Co., in Kansas City, Mo.

shown herewith. This branch is in charge of W. F. White, who has been connected with the Ruud company for more than twelve years.

PLUMBER BURIED ALIVE BUT RESCUED JUST IN TIME.

While making an excavation to tap a sewer, Will Wilkins, an employe of the Kennett Plumbing Co., of Malden, Mo., was covered by about three ft. of sand when the walls of the pit he had dug caved in on him. He was lying on the bottom of the pit cleaning some dirt from the point where the connection was to be made when, without warning, the earth crashed down on him.

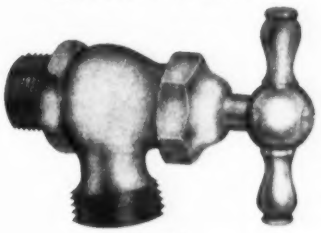
C. S. Revelle, owner of the Kennett Plumbing Co., who happened to be at the job, immediately summoned aid and went to work removing the earth from him. A paving crew working near by was promptly summoned. With the assistance of several helpers, Wilkins was soon dug out and he was little the worse for his experience. He came out smiling and as soon as he got his nerves under control, went back to work.

Wolverine

PLUMBERS BRASS AND SPECIALTIES

Compression Drain Cocks

QUICK-OPENING



No. 667

Substantial — Serviceable

FULLY GUARANTEED

We Sell the Retail Plumbing Trade Exclusively

WOLVERINE BRASS WORKS

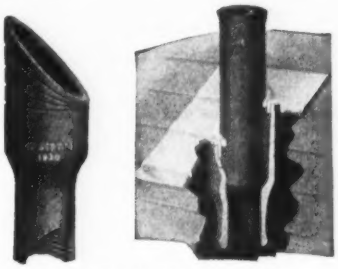
MANUFACTURERS

GRAND RAPIDS, MICHIGAN

WOLVERINE CO., Inc.
314 West 42nd Street
New York, N. Y.

WOLVERINE BRASS WORKS, Inc.
210-216 Natoma Street
San Francisco, California

Blake Patent Roof Fittings



As It Looks When Installed

This is the only fitting that can be calked or cemented to roof and made absolutely water-tight joint. Saves time and material. Notice markings or grooves where fitting can be cut to fit pitch of roof.

Galvanized sheet iron, sheet copper or sheet lead can be used in any size desired. Simply cut hole in it and turn edge down into roof joint, then place your piece of pipe into it and calk it all in. No leak is possible, and you use up your scrap pipe and scrap sheet.

Made in different sizes, and with spigot, or hub ends, also tapped.

No.	Size	Soil Pipe through roof
H-1712	1½ x 2 in.	(1½ I. P. x 2 in.)
H-1714	2 x 3 in.	(2 in. spigot x 3 in.)
H-1716	2 x 4 in.	(2 in. spigot x 4 in.)
H-1718	4 x 5 in.	(4 in. spigot x 5 in.)
H-1720	4 x 6 in.	(4 in. spigot x 6 in.)
H-1722	2 x 3 in.	(2 in. hub x 3 in.)
H-1724	2 x 4 in.	(2 in. hub x 4 in.)
H-1726	4 x 5 in.	(4 in. hub x 5 in.)
H-1728	4 x 6 in.	(4 in. hub x 6 in.)
H-1730	2 x 2 in.	(2 in. spigot x 2 in.)
H-1732	4 x 4 in.	(4 in. spigot x 4 in.)
H-1734	6 x 6 in.	(6 in. spigot x 6 in.)

A trial will convince you of their worth.

Order a Sample Lot from your jobber

Blake Specialty Co., Rock Island, Ill.

MONARCH
AUTOMATIC ELECTRIC WATER SYSTEMS

$117.00
Plus Freight from Dayton

MONARCH Water Systems are medium priced—some are higher, perhaps some are lower, but none are better at any price.

The Monarch line of deep and shallow well pumps covers every water supply requirement. Write for details

The Monarch Engineering Co.
250 E. First Street Dayton, Ohio
Export Office:
O P Brett, Mgr., 136 Water Street, New York

MONARCH
Wall Unit

Simplicity and Safety

are only two of the many exclusive features of the

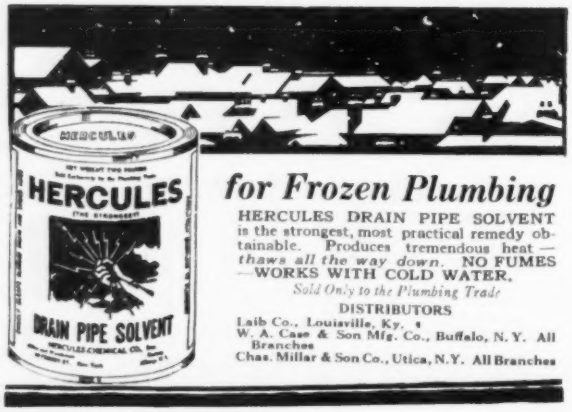
Wales Automatic Water Heater

which is built on an entirely new idea, as applied to the field of Water Heating for domestic use.

The many advantages of the WALES will appeal to you.

Write for complete details

The Wales Company
Kalamazoo, Michigan



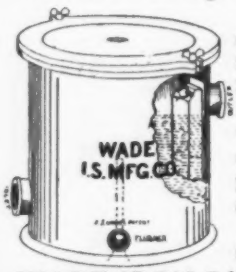
for Frozen Plumbing

HERCULES DRAIN PIPE SOLVENT is the strongest, most practical remedy obtainable. Produces tremendous heat — *thaws all the way down.* NO FUMES —WORKS WITH COLD WATER.

Sold Only to the Plumbing Trade

DISTRIBUTORS
Laib Co., Louisville, Ky.
W. A. Case & Son Mfg. Co., Buffalo, N. Y. All Branches
Chas. Millar & Son Co., Utica, N.Y. All Branches

Wade Traps Are Sanitary



This grease trap for laundry trays with accessible flushing cleanout, is absolutely water and gas tight. No sewer gas can escape even when cover is removed for cleaning. Deep water seal prevents grease passing out and clogging waste pipe.

Write for catalog showing full line.

WADE IRON SANITARY MFG. CO.
551 W. Fulton St., CHICAGO

TWO HUNDRED MASTER PLUMBERS TO TAKE A SHORT COURSE.

Two hundred master plumbers will meet in Urbana, Ill., for a short course in plumbing, which will be given under the auspices of the university during the week beginning January 29, 1923. There will be four illustrated lectures—two on the afternoon of January 30 and the other two on the afternoon of January 31 and ten laboratory demonstrations on February 1, 2 and 3. C. D. Brownell, of the Reliable Plumbing Co., Champaign, and H. E. Babbitt, of the College of Engineering, are in charge of the program.

CHICAGO ASSOCIATION INSPIRED TO GREATER EFFORTS AND PLANS NEW MEMBERSHIP DRIVE RESULT OF T. E. B. LECTURE.

Nearly three hundred master plumbers, heating contractors, jobbers and manufacturers, as well as sales representatives, gathered at the Morrison hotel, Chicago, on Tuesday evening, November 28, to hear the inspirational address of Col. W. G. Archer of the National Trade Extension Bureau. During the smoker, which preceded the lecture, the old timers gathered in knots, exchanging stories and confidences, and seemed as happy as a lot of school boys as they greeted those whom they had not seen for some time.

Among the veterans of the craft that were present at the meeting were Richard Finn; Peter Schmitt, honorary member of the Chicago local, and one of the oldest plumbers in Chicago, now retired; Thos. C. Boyd, who went into the plumbing business in 1856 and retired in 1898; Jos. W. Cannon, president of the National Association last year; Wm. J. Lang, past president of the Illinois Master Plumbers' Association; P. M. Murphy, past national president; John J. Cahill, president of the Illinois Master Plumbers' Association; Carl J. Stein, past president of the Chicago local; E. J. Benning, past president of the Illinois Master Plumbers' Association; A. W. Bahn, Thos. Hanley, Joseph Scheuer, Henry Breyer, George Franklin, and many others.

The Chicago Master Plumbers' Association, under whose auspices the meeting was held, proposes to add a number of new members to their roster and four candidates were given the oath of initiation by Past National President Cannon and Carl J. Stein at the beginning of the meeting.

J. C. Naughton, president of the association who occupied the chair, introduced John J. Cahill, president of the Illinois Master Plumbers' Association, who talked for a few minutes on the short courses in plumbing available at Champaign and Decatur, Ill., in February under the auspices of the University of Illinois. This was followed by short but interesting addresses by Jos. W. Cannon and P. M. Murphy, past presidents of the National Association, as well as by an address of Thomas Hanley, chairman of the standardization committee of the National Association of Master Plumbers, all of whom emphasized the importance of co-operation and the necessity of each member putting into the local association as much as he takes out. Two musical vaudeville acts also preceded the lecture of Col. Archer who, being introduced by the president, J. C. Naughton, gave an interesting two-hour talk, the subject of his discourse being along the line of plumbing salesmanship. He called attention to the many points that may be learned from the department store. "The Trade Extension Bureau can do a great many things, but it cannot wash your windows for you," he said, in driving home the point that ideas are of no benefit unless they are used.

The members of the local association felt that they had received much inspiration from the lecture and that it would help them to add new members to the association and to put their business on a higher and more profitable plane.

THE BEST ADVERTISING THEY HAVE EVER DONE.

In the accompanying illustration is shown an advertising project arranged by the Strumquist Engineering Co., of Albuquerque, N. M. This exhibit was shown at the Merchants' Exposition which was held in that city from October 31 to November 4.

They say that this method of advertising is far more effective than any other advertising they have ever done.

The Exhibit of the Strumquist Engineering Co., of Albuquerque, N. M., at the Merchants' Exposition Held Recently in That City.

They claim that it stimulated business, and although they did not keep an accurate account of sales resulting from this advertising, they know that it paid big.

"WHY NOT LEARN A TRADE?"—EDITORIAL.

"Why not learn a trade?" is the subject of an editorial that is being distributed widely among newspapers by the National Trade Extension Bureau. A great many newspapers are publishing this editorial, which should attract boys of mechanical inclination to the plumbing and heating trades.

SAN ANTONIO PLUMBERS OFFER PUBLIC REAL SERVICE.

A most creditable advertising campaign is being carried on by the San Antonio, Tex., Associated Plumbing Dealers. Two noteworthy features of their advertising are the following unusual notice and guarantee which are incorporated in every ad:

"Notice.—This association offers its service FREE in all of San Antonio's suburbs for the inspection of plumbing. The city ordinances protect you in the city. We will protect you if you live out of the city limits.

"Guarantee.—This association guarantees the work of its members and will adjust without charge any complaint regarding defective workmanship or materials, or over charges. Address all complaints to the association, giving all details. Membership in this Association is open to all plumbing and heating dealers who will conform to its standards of practice."

The dealers who are offering this service with a capital "S" are: E. H. Jordon, Paul Luckenback, A. H. Shafer, Kirkwood & Wharton, A. J. Monier & Co., O'Brien Plumbing Co., Specia Plumbing Co., Jud & Ormond, Walter Pape, Reiwald Co., Nigra Plumbing Co., R. G. Thomas, West & Gutzeit, Gutzeit Bros., A. Collman, E. A. Rhodius, Brown Plumbing Co., Fred Basenberg, Fred W. Geyer, Braden Hudson Co., and Kroeger Bros., all progressive plumbing contractors of San Antonio.

Reliable Sanitary Floor Drains

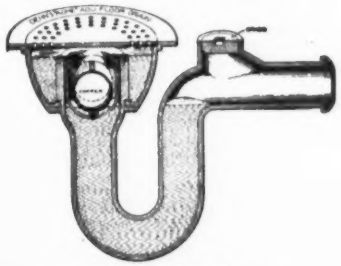


Fig. 7—Patented

Dehn's *"AcmE"* Deep Seal Continuous Pipe Trap Floor Drain with Automatic Back Water Valve.

Approved and recommended by all Departments of Health and Sanitary Engineers. These have stood the test for many years.

Beware of the Infringer and Imitator with his contraptions.

We manufacture a full and complete line of Floor Drains for every type of installation.

Catalog free upon request

Compound Injector & Specialty Co.

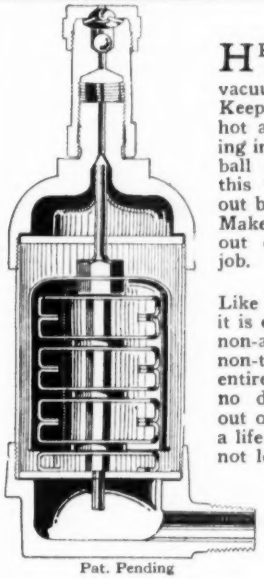
Established 1897

Originators, Designers and Sole Manufacturers of

DEHNSANICARD

419-421-D North Laramie Ave., Chicago, U. S. A.

THE SUPREME AIR AND VACUUM VALVE



Pat. Pending

HERE is the best, non-adjustable, air and vacuum valve ever made. Keeps the radiators red hot and effects a big saving in coal. The aluminum ball check in the top of this valve lets all the air out but prevents its return. Makes a vacuum system out of a one-pipe steam job.

Like all "Supreme" Valves, it is entirely automatic and non-adjustable — therefore non-tinkerable. Being made entirely of metal there are no delicate parts to get out of order. Built to last a life time. Absolutely will not leak steam or water.

Fully guaranteed for five years. Price and discounts on request.

C. FEUSER & SON

24 Watsessing Avenue

BLOOMFIELD NEW JERSEY

NO ROOF IS SUPERIOR TO ITS FLANGE

Therefore, some PLUMBER is the father of every leaky roof.

The Bullard Roof Flange

is acknowledged as the only PERFECT FLANGE by busy men who have made satisfying installations.

THE BULLARD SPECIALTY CO., Tiffin, Ohio

PLENTY OF
HOT WATER
NO EXTRA EXPENSE

EASILY connected to outside of steam, vapor or hot water boiler; does away with fuel-wasting coil in fire pot. Uses surplus heat of boiler. Does not overheat or underheat. Will not burn out, once installed.

An unusual opportunity for live dealers. Order now and be prepared for the demand being created. We furnish co-operation and practical sales helps to give you full benefit of our national advertising.

Write for full details
THE HOTSTREAM HEATER CO.
"Makers of Heaters that Heat"
The Hotstream CLEVELAND, Ohio
We also make a complete line of Gas and Kerosene Water Heaters.

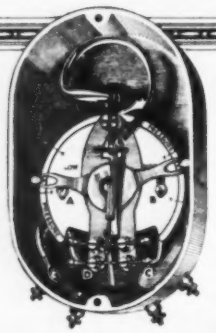
INDIRECT WATER HEATER

MYERS Self-oiling

Decidedly different — unlike others, MYERS SELF-OILING POWER PUMPS and WORKING HEADS have created a new era in the pumping of water by power. Enclosed working parts, a positive oiling system, large valves, unrestricted waterways and other features permit operation at high speed or against heavy pressure, greatly increase the volume, eliminate wear, accidents and breakage, and reduce operation costs. Different styles and sizes for all needs.

Write today for literature and prices
THE F. E. MYERS & BRO. CO., Ashland, Ohio

Bulldozer POWER PUMPS



Automatic Control for Steam and Vapor Heating

THE Minneapolis Pressure Regulator affords positive control of pressure in steam or vapor heating plants in apartment buildings, hotels, hospitals, schools, and public buildings.

No overheating. Maintains continuous, comfortable temperature. Saves fuel. Can be used in connection with room thermostat. Thus temperature and pressure control boiler. Operates perfectly on coal, gas or oil heaters.

Pressurestat only, list $25.00
With spring motor, list 49.00
With electric motor, list 74.00

MINNEAPOLIS HEAT REGULATOR CO.
2801 Fourth Ave., South MINNEAPOLIS, MINN.

GREENBERG WILL ADDRESS MINNESOTA PLUMBERS.

J. C. Greenberg, of The National Trade Extension Bureau, will address the Minnesota Retail Plumbers' Association on December 15th at the Chamber of Commerce, Duluth, Minn.

THIS AND THAT—HERE AND THERE.

Geo. H. Drake, of Buffalo, N. Y., who is a member of the standardization committee of the National Association of Master Plumbers, visited the Association offices at Detroit last week.

Geo. A. Gent, Edwardsville, Ill., has been awarded the plumbing, heating, ventilating and vacuum cleaning contracts for the six-story office and bank building of the Edwardsville National Bank.

Robert Walsh, of Galesburg, Ill., has gone to Eureka, Ill., where he will open a plumbing shop.

F. C. Eberfuhr, Chippewa Falls, Wis., has installed the plumbing and heating systems in the new Zion Evangelical church at that city.

The Peninsula Heating & Plumbing Co., of Laurium, Mich., which is now installing the plumbing and heating systems in two schools at Florence, Wis., has been awarded the contract for plumbing installations in the Spurr township school, Michigamee.

N. W. Noble, Columbus, Kans., has moved his plumbing business from 125 North Kansas Street to 315 West Sycamore Street.

Joe Pressler, of Marshall, Texas, has received the contract for the plumbing installation in the Harrison county courthouse.

CONVENTION DATES.

December 5, 1922.—Annual meeting of the Copper and Brass Research Association, to be held at Association headquarters, 25 Broadway, New York City.

January 9, 10 and 11, 1923.—Conference of State, Local and Field Secretaries of Master Plumbers' Associations, at the National Trade Extension Bureau's headquarters, Evansville, Ind.

January 16 and 17, 1923.—Annual convention of the Wisconsin State Master Plumbers' Association, in Beaumont Hotel, Green Bay, Wis.

January 23, 24 and 25, 1923.—Annual convention of Iowa State Master Plumbers' Association, at Sioux City, Ia.

January 23, 24, 25 and 26, 1923.—Twenty-ninth annual meeting of the American Society of Heating and Ventilating Engineers, at Washington, D. C.

January 29, 30 and 31, 1923.—Thirty-first annual convention of the Illinois State Master Plumbers' Association, at Decatur, Ill.

February 6, 7 and 8, 1923.—Annual convention of the Ohio State Master Plumbers' Association, at Cincinnati, Ohio.

February 26, 27 and 28, 1923.—Annual convention of the Missouri State Master Plumbers' Association, at the Hotel Statler, St. Louis, Mo.

March 29 and 30, 1923.—Annual convention of the Michigan State Master Plumbers' Association, at Saginaw. The headquarters will be at Hotel Bancroft and the meetings will be held in the Auditorium.

April 18 and 19, 1923.—Annual meeting of the National Metal Trades Association, Hotel Astor, New York.

June 25, 1923.—Annual convention of the New Jersey State Master Plumbers' Association, at Atlantic City.

June 26, 27 and 28, 1923.—Forty-first annual convention of the National Association of Master Plumbers, at Atlantic City, N. J.

IN THE CHICAGO SUPPLY MARKET.

(Continued from Page 390.)

It is a little early to say to just what extent the market will be affected by this strike. The manufacturers have been able to ship all the goods they had in stock, and to put through their glost kilns some of the ware that was in their biscuit warerooms. So the real pinch has not yet come, but it would seem likely to develop between now and January 1st.

One manufacturer thinks that there will be very little difference in price, and, if there should be, it will be so slight that it will not cause very much difference in the demand.

Boilers and Radiation.

From most of the manufacturers the report is no change in prices, and they can see no change in the near future. At the same time an advance of 5 per cent on range boilers is announced by one firm. The demand continues fair.

Soil Pipe.

There are no new developments and no change in prices. The demand is still active.

Brass Goods.

There is no change in price. The demand is brisk, as it has been for many weeks.

Enameled Ware.

"There is no doubt," said a prominent manufacturer, "that the demand for enameled ware will continue quite strong for some time, although the demand for this product is keeping up with production. The inability to get cars is the most embarrassing situation in our field."

IN THE NEW YORK SUPPLY MARKET.

Lifting of Embargoes Affects Demand—No Notable Change in Prices.

New York, N. Y., November 28.—There is really little change to report this week in the New York plumbing and heating supply market. Demand continues exceptionally good for the time of the year, the falling-off which would occur about this time in normal years having been largely offset by the activity created by the lifting of various railroad embargoes. According to the jobbers, this factor is likely to exercise a very beneficial effect on demand for some time to come and may carry the trade forward at its present ratio of activity right through to the end of the year, barring development of threatened labor troubles in the constructing field.

The inventory period which will then ensue will cause a lot of hard thinking this year. Stock values at December 31st, will be widely different in many cases from the levels at which the material was bought, especially where it has been held for any length of time. Those jobbers who can show appreciations sufficient to equate the depreciation will be fortunate but it is to be feared all will not be able to do that.

Soil Pipe.

Soil pipe continues to show a fair activity, notably so for the time of the year, and prices are firm. The shortage is not so acute as it was, but material is still coming in more slowly than the situation requires. The lifting of the embargoes by some of the railroad lines has helped, but a situation such as existed in regard to this commodity for so prolonged a period cannot be adjusted all at once, even when the obstacles are removed—and they have been only partially removed at that.

Wrought Iron Pipe.

Wrought iron pipe jobbers are marking time for various reasons, so far as buying is concerned. Some filled their requirements for some time ahead before prices were advanced recently, and those who could not afford to think there may be a decline soon and are not buying beyond present needs.

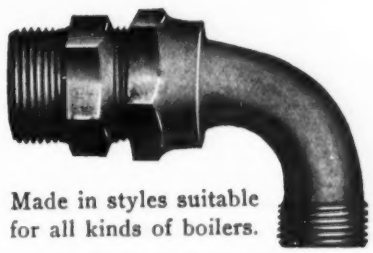
Steel Pipe.

Steel pipe is better than it was as to supply, and demand is moderately good. Stocks, however, are low, jobbers in this

Brass Goods That Make Good

everywhere they are installed

TRENTON
Boiler Couplings



Made in styles suitable for all kinds of boilers.

We also make the "Trenred"—a heavier coupling of red brass.

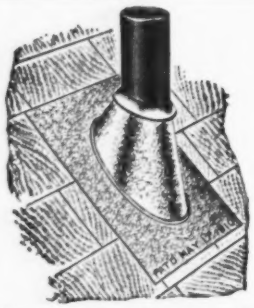
The Trenton Line of Plumbers' Brass Goods is carried by all jobbers.

The Trenton Brass & Machine Co.
Trenton, New Jersey

Somerville
(S. I. W.)

Soil Pipe and Fittings

Are mechanically correct



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Specify and Use the Reliable

"SIMPLEX"

Made in All Lead—Copper—Galvanized Iron

Every Flashing Adjustable
Every Flashing Perfect

Manufactured only by

Simplex Mfg. Company, 213 W. Austin Ave., Chicago

Canadian Representative:
W. H. Cunningham & Hill, Ltd., Toronto, Ont.
New York Representative, John G. Kelly, 137 E. 43rd Street

THE OWNER *WON'T PAY*—

and the Dealer Can't Afford to Pay for Unlimited "Free Service"

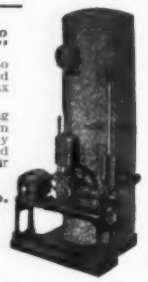
The only water system you can afford to sell is the system that is so well designed and built that "free service" is not a tax on your profits.

Write for this free booklet describing Paul Water Systems and water system installation and you will understand why Paul dealers have practically eliminated profit-killing "free service" from their water-system business.

Send for your copy of this book today!

Ft. Wayne Engineering & Mfg. Co.
1706 N. Harrison St., Ft. Wayne, Ind.

Service Offices, carrying systems in stock: New York, Philadelphia, Boston, Minneapolis, Portland, Ore., Kansas City, Mo. Also service offices at Buffalo, Providence, R. I., Pontiac, Mich., Peoria, Ill., Madison, Wis., Wilson, N. C., Omaha, Neb.



There is a Paul Water System to meet all requirements of any capacity, pumping from shallow or deep well, cistern or spring.

WATER PAUL SYSTEMS

A New Pacific Boiler Catalog

A NEW catalog which completely describes and illustrates Pacific Steel Heating Boilers is yours for the asking. It will give you prices, specifications, and measurements and can be conveniently filed in your correspondence files for future reference.

General Boilers Company
Waukegan, Illinois

Cut Their Own Threads

as they are driven home with a screw-driver. One of the greatest time-saving devices for attaching parts to marble, slate, stone, etc., ever invented. Eliminate all tapping expenses and make a tighter bond.

Parker Hardened Self Tapping Screws

are so hardened they will cut their own threads, even when driven into metal. The unthreaded end acts as a guide, registering screw in hole so that it will always start itself straight (see illustration.)

Send for samples

PARKER SUPPLY COMPANY
785 E. 135th St. New York, N. Y.

as in other lines of supply not caring to plunge too far ahead. There is an apparent intention among the trade to hold stocks down to the lowest possible level until the inventory has been passed, as the situation in regard to future commodity values is altogether too uncertain to take any unnecessary chances.

Brass Goods.

Brass goods are reasonably active but supplies are scarce and hard to obtain.

Pottery.

Pottery for obvious reasons continues a disturbing factor in this supply market, with production more or less held up and demand quite active. It is stated now that the strike was partly precipitated by the unrest engendered among moulders by reason of the pending introduction of the new process of pouring, which will eliminate many members of this trade from employment at the pottery plants.

Enameled Ware.

Porcelain enameled ware is also scarce and hard to obtain, with a brisk demand. Deliveries are scheduled at from 60 to 90 days, with no guarantee at those extended periods.

Boilers and Radiation.

Boiler and radiator equipment shows no improvement as to supply, while demand is increasing all the time. The situation in this line is growing really acute, and it is considered doubtful whether supply will overtake demand during the present winter season at all. The suggestion made to the writer by a jobber last week that some day a manufacturer of heating equipment would take his courage in both hands and produce away ahead of his own market in the hope of being able to clean up on the production shortage of his rivals, is endorsed as a possibility by others in the trade, the main obstacle being that competition in this line is excessively keen and that if the enterprising manufacturer referred to did not clean up promptly he might find himself in a difficulty with a quantity of unrealizable material.

LEGAL QUESTIONNAIRE.

(Continued from Page 379.)

other one agreement; but this second proposition is not quite as clearly provided for as the first one. The act provides that the proper officials "shall award the respective work specified in the above subdivisions separately." The usual construction of such a provision would mean that the subdivisions are "1" and "2" and not the extra subdivisions of those subdivisions.

I am sorry that I have not the advance sheets of the 1922 acts of your Assembly so that I might let you know whether the 1921 act has been repealed or changed. By taking time I could ascertain the facts for you, but feel that you can secure this information yourself more speedily by inquiry as I have suggested.

VAPOR AND VACUUM HEATING SYSTEMS.

(Continued from Page 367.)

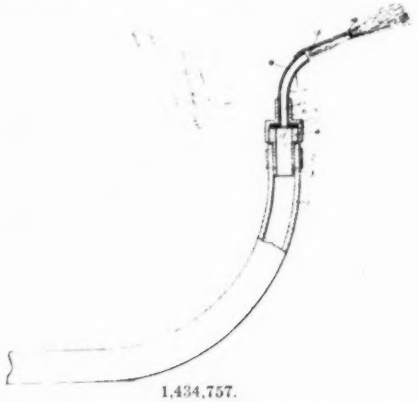
Neither of these typical vacuum pump systems is applicable to the ordinary residence. I have given space to a slight description of them because they were the forerunners of the vapor systems already described, which are suitable for residence work, and some of them quite as suitable for the largest building propositions as the original Williames idea, or any of its improvements, which depend upon machine force to accomplish that which the natural forces of steam, air and difference in pressure, can produce more cheaply and with much less expense for care, repair and attention.

The big buildings in the past twenty or thirty years have been a fertile field for the vacuum pump engineers. There is, today, a still greater field for vapor heating opened by the activities of the no pump vapor heating development of the last few years.

Patents

PLUMBING DEPARTMENT.

1,434,757. Water Distribution and Delivery. Edwin E. Thomas, Portland, Ore., assignor of one-half to W. C. Alvord, Portland, Ore. A device of the kind described, comprising a flexible pipe in combination with means for forcibly

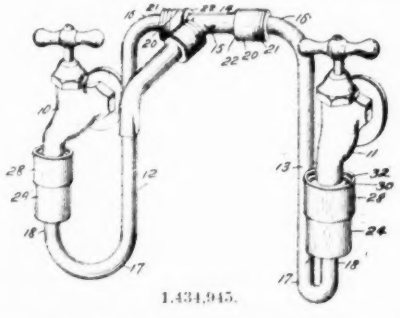


1,434,757.

deflecting the flow therefrom substantially at its point of discharge, whereby the pipe may be rendered terminally self-erective and operatively sustainable in a fixed elevated position by the force of the flow of the current which it delivers.

* * *

1,434,945. Water-Supply-Faucet Attachment. Isidor Cooper, Brooklyn, N. Y. A twin faucet attachment comprising a tubular coupling member to lie between the faucets and having a forwardly projecting discharge spout, substan-



1,434,945.

tially vertical tubular branch members having inwardly extended upper ends connected with the ends of said coupling member and divergent lower ends which curve downwardly and then upwardly to provide vertical terminals below said faucets, and casings mounted on said terminals and provided with apertured yielding diaphragms to be pushed upwardly on and closely engage said faucets, said branch members each being one integral piece of tubing whose upper end curves inwardly toward said coupling member and whose lower portion while curved as described also extends forwardly and outwardly, whereby the body of the tube is adapted to set backwardly of the front of the faucets.

* * *

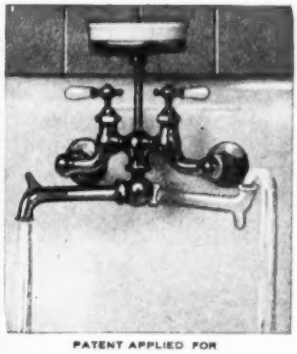
1,435,067. Flush Valve. Lindsay R. Hurst, Louisville, Ky. A flushing device including a casing having an inlet and an

Pierce Pebco
Steam and Water Boilers

CAPACITIES
From 325 to 1550 Steam
From 525 to 2500 Water

Order from us or through your local jobber

Pierce, Butler & Pierce Manufacturing Corp.
Brooklyn, Boston, Worcester, NEW YORK, Detroit, Syracuse, Newark, Philadelphia, Baltimore, Washington



Gopher Combination Sink Faucet

THE latest improved, most up-to-date fixture made. Double sink faucet with drinking fountain combined.

Order from your jobber. You'll find it will make a hit with your customers.

Union Brass & Metal Mfg. Co.
(ESTABLISHED 1903)
St. Paul Minnesota

The Gopher Line includes: Fuller Work, Compression Work, Quick Opening Work, Ground Key Work, Ball Cocks

PATENT APPLIED FOR

ACME DETROIT Drinking Fountain

Adjustable to All Pressures

A strictly sanitary fixture suitable for use in all classes of buildings. The price is right, too.

We make a line of high grade
Basin Cocks, Wash Tray Bibbs
Sink Bibbs, Sill Cocks
Drinking Fountains, Boiler Drain Cocks
Solder Nipples

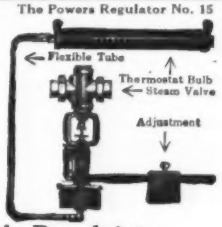
If your jobber hasn't our goods in stock write us, giving his name.

Acme Brass Works, Detroit, Mich.
Eastern Representatives: Kessel & Muller, New York
Western Representative: H. E. Crum Jr., 79 W. Monroe St., Chicago, Ill.

"Put It There"

In practically any place where exact temperature is necessary, a Powers Regulator is made to meet the need. "Put It There!" and eliminate the loss of money and material resulting from failure to maintain proper temperature.

The Powers Regulator No. 15



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Tell us your heat control problems. We are glad to give you the benefit of our thirty years of study and experience; it will place you under no obligation, and will probably show you where to reduce costs, for your customers.

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Specialists in Automatic Heat Control
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Your Telephone Directory will tell you if one of our 28 other offices is in your city. (1807-B)

For fifty years we have manufactured the

BARRETT
Back Water, Sewer and Tide Trap

and it always has been and now is the best fixture for its purpose on the market.

James Barrett Mfg. Co. 115-121 Pearl St. Boston, Mass.

Shower Bath
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A concealed combination Shower with Supply and Waste Bath Fixture

A
HUDSON
PRODUCT

Many other showers shown and described in our No. 21 Catalog. Write for it.

Hudson Brass Works
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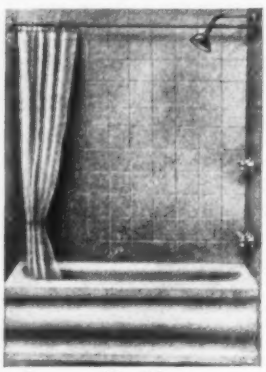
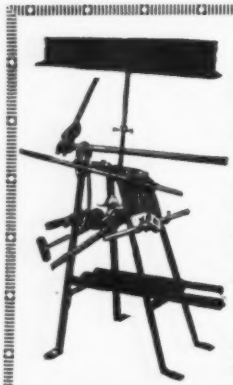


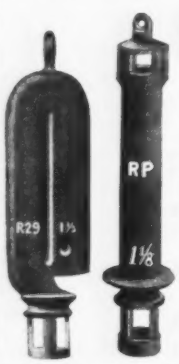
No. 405



Absolutely Indispensable

This is the verdict of the business men who have used our Standard Portable Vise Bench and Pipe Bender. Several improvements. Write for catalogue and list of hundreds of satisfied customers.

Standard Iron Works, Inc.
508-10 E. 74th St. - New York City



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GALVANIZED
CAST IRON SYPHONS

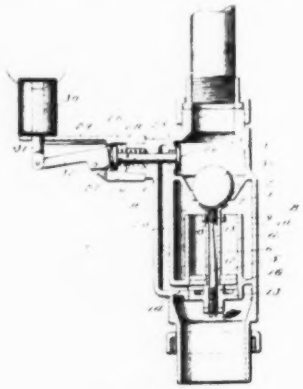
Represent the highest standard of workmanship and quality of material.

We make a complete line of all styles and sizes, including cross bars and levers.

Catalog 9 illustrates and describes the Riverside Line—write for it.

Riverside Foundry & Galvanizing Co.
500 Harrison St. Kalamazoo, Mich.

outlet in direct line, a main valve for controlling communication between said inlet and outlet, a cylinder beneath said valve, a piston in said cylinder having an upwardly projecting hollow stem for unseating said main valve when the piston is moved upward, said stem having a valve support at its upper end and being provided with a lateral aperture beneath said support, means in said stem for adjustably controlling the area of said aperture, a by-pass leading from the inlet

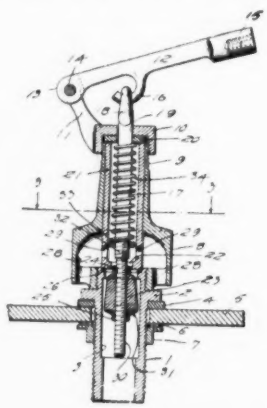


1,435,067.

side of said casing to the outlet side beneath said piston, a spring-actuated valve for controlling communication between said inlet and outlet through said by-pass to permit pressure to be applied to said piston to unseat said main valve, said hollow stem and its aperture forming a timing device for the escape of water beneath said piston as the latter is forced downwardly to permit seating of said main valve.

* * *

1,435,083. Flush-Tank Valve. Clyde M. Saylor, Donora, Pa., assignor of one-fourth to Wilson W. Reed, Donora, Pa. A flush tank valve comprising a tubular base member, a superposed tubular member having a valve seat supported on said tubular member, said members having water passages



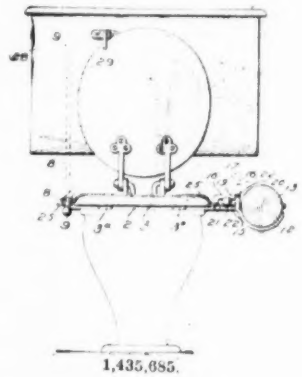
1,435,083.

therethrough, a valve stem suspended from a lever pivoted at one end on a fixed support above said superposed member and carrying a valve adjacent said seat, said lever carrying a float at its free end, and a spring acting in opposition to the upward movement of said float-lever to unseat the valve when the lever is lowered.

* * *

1,435,685. Attachment for Water-closet Seats. William S. Bangen, Havana, N. D. A water closet seat attachment comprising a pair of spaced brackets adapted to be secured to the under side of the seat in a transverse position at the front and back respectively, and extended at each side of

the seat, a paper roll holder supported on the extensions of the bracket at one side, a base plate mounted on the extensions between the paper roll holder and seat, a holding and severing device comprising a pair of spaced elongated bars substantially co-extensive with the base plate and extending

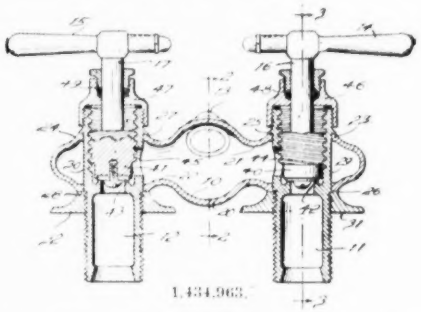


1,435,685.

longitudinally thereof, means for hinging said device to the base plate, and other means mounted on the extensions of the brackets at the other side of the seat for engaging the free edge of the paper to hold the same in taut condition.

* * *

1,434,963. Bath Cock. Emil M. Rogert, Euclid Heights, Ohio. A bath cock body comprising substantially a surface of revolution wherein the generating line crosses the axis of

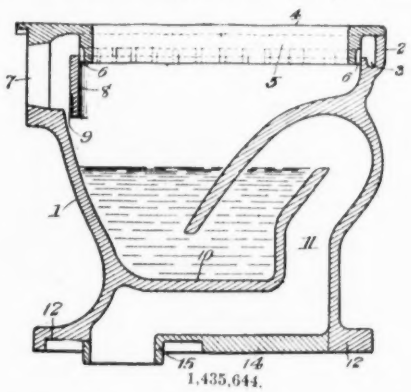


1,434,963.

revolution adjacent the ends of the body, whereby the body may be supported at the ends thereof in a work revolving machine.

* * *

1,435,644. Sanitary Bowl. John F. Kelly, Trenton, N. J., assignor to Thomas Madock's Sons Co., Trenton. The



1,435,644.

method of constructing a pottery-ware bowl having a flushing rim, which comprises forming the body of the bowl together with the outer section of the rim, separately forming the top and inner skirting of the rim, and uniting the top of

Weil-McLain

SCIENTIFIC COMBUSTION

BOILERS

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bring quick sales—Write
for details of this money maker

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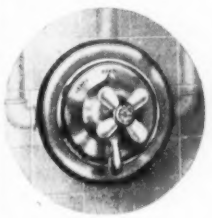
Michigan City
Indiana

Chicago Show Rooms
641 W. Lake Street

Cold—Tepid—Warm—Hot

the temperature stays where you want it



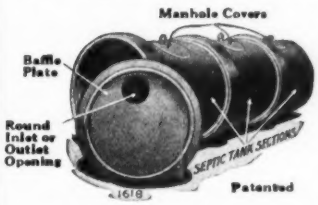
THE LEONARD
WATER MIXING VALVE
(*Thermostatic*)

Set the pointer to the temperature you wish to maintain. Regulate the volume of the shower as you wish by turning the wheel.

That's all there is to it. What could be simpler?—and the Leonard Valve always works.

LEONARD-ROOKE CO. Providence, R. I.

A Material You Prefer to Install



The Dickey Septic Tank is made in sections of Vitrified Salt Glazed Clay and is as easy to install as Vitrified Sewer Pipe.

No forms, bolts, or reinforcing to complicate the work.

Your customer will also prefer this permanent material when he understands its merits as you know them from experience.

Write for complete details

W. S. DICKEY CLAY MFG. CO.
KANSAS CITY Established 1885 · MISSOURI

"Thrift" House Heating Range

Heats 8-room house by hot water. Gives separate domestic hot water. Cooks and bakes. No extra coal. 350 sq. ft. of radiation. 70° in zero weather guaranteed.

Write for details. Exclusive agents wanted

Zimmerman Stove Heater Corp.
25 W. 43rd St., New York, N. Y.

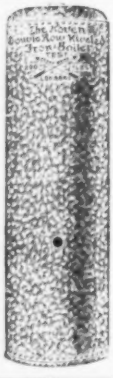
Gerstein
Cistern and Riveted Pressure Boilers
can be described in one word—

Everlasting

They not only *last* but give continuous, satisfactory service.
Made in any size, pressure or capacity desired.

Write for details

Gerstein Bros. & Cooper
Coppersmiths
1-3 W. Third Street **So. Boston, Mass.**



FOR lasting quality and true capacity use "*Koven*" Pure Iron Double Row Riveted, Galvanized Range Boilers, or *Naco* Galvanized Range Boilers made of open hearth steel. These boilers may be bought of jobbers everywhere.

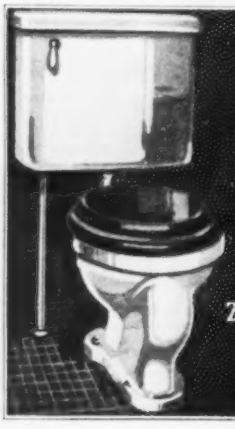
L. O. KOVEN & BRO.
154 Ogden Ave. **Jersey City, N. J.**

Originators of PERFECT Two-In-One Closet Seat

Laminated construction for strength and durability. Costs no more than other good seats.

Ask your jobber or write for catalogue

Perfect Tank & Seat Co.
917 Canal Street **Syracuse, N. Y.**



ZECO

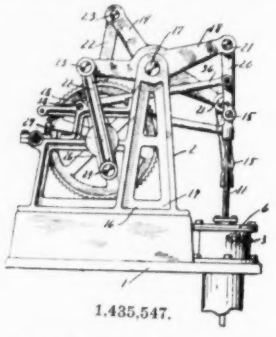
A vitreous china tank with a set of real fittings

ZWERMANN COMPANY
Robinson, Illinois

the rim to the upper marginal edge of the outer rim section and uniting the skirting at intervals to the inner face of the rim.

* * *

1,435,547. Pump. Clarence J. Noel, Orange Cove, Cal. In a pump, in means for securing for a reciprocating plunger an advanced working stroke, a frame, a bent walking beam presenting a rear arm disposed horizontally when in one

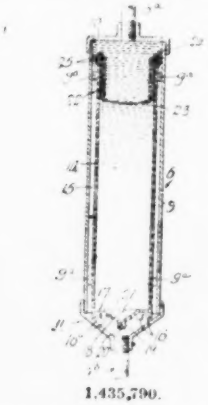


1,435,547.

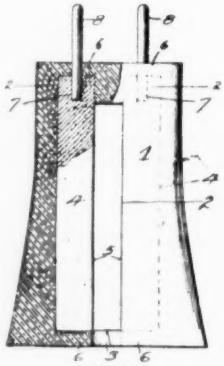
extreme position and a slanting front arm pivotally mounted in the frame, an operative connection between the front arm and the plunger, and rotary driving means for rocking the horizontal arm in a vertical plane substantially limited by the horizontal plane of the beam pivot disposed at a horizontal distance from the end of the horizontal arm by substantially one-fourth of its maximum throw.

* * *

1,435,790. Sterilizing Attachment for Water-supply Pipes. Walter S. Bachman, Chicago, Ill. A sterilizing attachment for water supply pipes, comprising a casing adapted to be interposed in a water supply line and to form a part thereof, means providing a container within the casing for a sterilizing agent, while at the same time permitting a free flow of water through said casing about the container, which has a small discharge opening at one end, a differential pressure member associated with the other end of the container for keeping the sterilizing agent separate from the water in the casing, said member being active under the pressure of the water when flowing through the casing to discharge a part of the sterilizing agent out through the discharge opening of the container into said water.



1,435,790.



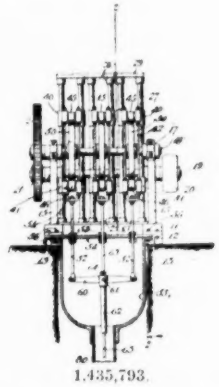
1,435,559

1,435,559. Electric Water Heater. Frederick Eugene Shepard and John Edmond Phillips, Tampa, Fla. An electric heater comprising a body member formed from insulating material and having a transversely disposed opening extending therethrough, spaced carbon members imbedded in the body member, said spaced carbon members having their adjacent faces in registration with the opposite faces of the transversely disposed opening, and conductor members connected

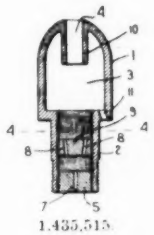
to the carbon members and extending through the wall of the body member.

* * *

1,435,793. Pump. Archilles A. Barton, Glendale, Cal. A pump head comprising base pedestals, a main shaft carried in bearings, three cams on said main shaft, three reciprocating heads each co-operating with one of said cams, guiding means for each of said heads, two polish rods each connected to one of the two outer heads, an inner pump rod connected to the center head, a discharge T into which said polish rods and said pump rods extend, a cover for said T through which said polish rods and said inner pump rod pass, means for making a tight closure about said rods where they pass through said cover, a water column connected into said T and through which said inner pump rod passes, an outer pump rod surrounding said inner pump rod, and means inside said discharge T connecting said polish rods with said outer pump rod.



1,435,793.



1,435,515.

1,435,515. Bubbler Fountain. Cecil C. Chadwick, Newton, Mass. A bubbler having a chambered head and a hollow neck portion, said head having a discharge opening, two plugs screwthreaded into the neck portion and adjustable relative to each other, both plugs having apertures therethrough out of alignment with each other and the outer plug having apertures giving a greater total cross-sectional area than those of the inner plug.

OBITUARY.

Peter F. Jirtle.

Peter F. Jirtle.

Peter F. Jirtle, a well known plumbing dealer of Chicago Heights, Ill., died at his home in that city on Friday, November 24, in his 53rd year, after three months' illness. He was a highly esteemed member of the Southern Cook County Master Plumbers' Association. He was known as "President Wilson's Double" on account of his facial resemblance to the former President. Mr. Jirtle is survived by his widow and two daughters.

B. W. Brady Called by Death.

B. W. Brady, who, up to the time of his retirement two years ago, was president of Brady & Co., heating, ventilating and power engineers of Chicago, died suddenly last week at his home in this city. He was born in Gilman, Ill., sixty-four years ago, and came to Chicago in 1903, at which time he established Brady & Co. He is survived by his widow.

Insurance
Against Flooded Basements

Where the Signet Drain is installed there can be no back water.
A perfectly reliable trap that automatically keeps out sewage, gas and germs.

Pat. Dec. 8, 1914

Write for details

TRADE MARK SIGNET REG. U.S. PAT. OFF.

Always works. Nothing to get out of order. Brass working parts submerged.
The Signet is clean, sanitary, simple, durable and efficient.

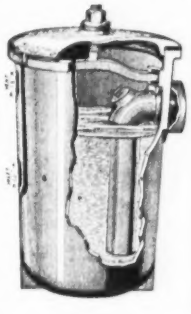
CRAMPTON-FARLEY BRASS CO.
KANSAS CITY, MO.

Raymond's Lead Roof Flanges
Manufactured by
Raymond Lead Works
735 S. Washtenaw Ave. Chicago
are the **Best**
SIMPLICITY OF DESIGN—EFFICIENCY IN SERVICE
—RECOMMEND THEM
Use No Other
If your JOBBER does not handle them send your order to us direct

Haas
Flush Valves for use in combination with all styles of bowls for all classes of service to operate under low or high pressure water supply.
Water Closets for every type or class of service.
Frost Proof Closets. Direct flush or after flushing.
Write for catalog.
Philip Haas Co., Dayton, O.

Easy to Clean Out

The Round Boston Grease Trap is made particularly for installation under sinks and in small restaurants. The cover plate, which is the full diameter of the body of the trap is held in place by a single nut. This large opening makes it very easy to clean out accumulated grease. Also made in square pattern for use where space is limited in height.



Write for catalog and prices.

R. ESTABROOK'S SONS
First and C Sts., South Boston, Mass.

Classified Advertisements

8 cents for each word including heading and address. Count seven words for keyed address. Minimum $2.00. One inch $4.00. Cash must accompany order. Copy should reach us by Wednesday morning.

Situations Open

DISTRIBUTORS AND SALESMEN wanted — To develop and organize territories now being allotted for the sale of Electric and Engine Driven House Pumps and complete Residence Water Supply Systems through plumbers, Hardware and Electrical Dealers. Equipment manufactured by one of the largest Pump Companies in the country, nationally known. Specialty Salesmen with pump experience preferred or experienced in selling Water Heaters. Attractive propositions open to "real salesmen" with clean successful records. There is a big market and ever growing demand for small house pumps. This line will give you an opportunity to increase your earnings and get into a very profitable paying business for yourself. Unless you are capable of producing—don't answer. State age, experience, present line. Address 667, "Domestic Engineering," 1900 Prairie Ave., Chicago, Ill.

WANTED—SALES MANAGER FOR A large manufacturer of plumbing goods located in the East. Must have executive ability as well as thorough knowledge of the line. Address 659, "Domestic Engineering," 1900 Prairie Ave., Chicago. 11-11tf

BUSINESS OPPORTUNITY—WE ARE about to place agencies in the principal cities throughout the country on our line of automatic and non-automatic storage gas water heaters. Thirty-five thousand sold in California alone in two and one-half years. Interested parties, please write to General Water Heater Corp., Hooper Ave., at 16th St., Los Angeles, Cal. 10-21tf

WANTED — COMPETENT MAN TO act as manager of plumbing shop. Must be thoroughly experienced in the plumbing business, estimate, etc. Apply W. N. Katz, 4362 W. 3rd St., Los Angeles, Cal. 12-2

WANTED — SALES MANAGER AND city salesman for western sales agency working seven salesmen. Must have a thorough knowledge of plumbing and heating materials. Man will take entire charge of business. Headquarters at San Francisco, Cal. Investment required for half interest. Give complete details of present and past positions and salary paid. Man experienced in selling the jobbing trade preferred. Address 679, "Domestic Engineering," 1900 Prairie Ave., Chicago. 12-2

SALESMEN WANTED—EXPERIENCE SALESMEN WANTED—EXPERienced men only who regularly call on Steam Heating and Plumbing Supply trade in Eastern States, North and South, can connect with large manufacturer of staple allied line on lucrative commission basis. Territory allotted and permanent. Connection assured to qualified men. Address P. O. Box 819, City Hall Station, New York City. 12-2-9

WANTED — EXPERIENCED BRASS and specialty salesman for Iowa, Illinois and Wisconsin. Reference and experience required. Address 676, "Domestic Engineering," 1900 Prairie Ave., Chicago. 11-25

WANTED — SALESMEN TO SELL A grade line of plumbing brass goods and specialties on a commission basis. Several territories open in Indiana, Ohio, Michigan, Kentucky, West Virginia, Pennsylvania and New York. Sheridan Brass Co., 2526 Detroit Ave., Cleveland, Ohio. 11-25/12-2

SALESMAN WANTED — LARGE manufacturer needs services or experienced salesman to handle trade with jobbers of plumbing and heating supplies. Good opportunity for man of large experience and acquaintance. Address 668, "Domestic Engineering," 1900 Prairie Ave., Chicago. 11-18/12-2

WANTED—PLUMBING AND HEATing salesmen. Must have experience and thoroughly posted on line. Only replies stating full details of experience and salary expected, considered. Address 654, "Domestic Engineering," 1900 Prairie Ave., Chicago. 11-12-2

For Sale

FOR SALE — PLUMBING, HEATING and electric business. Well established. Plenty of work. Must sell to dissolve partnership. This proposition is well worth investigating. Address 678, "Domestic Engineering," 1900 Prairie Ave., Chicago. 11-25

FOR SALE — OSTER POWER MAchine No. 204A practically new, with or without motor and countershaft. New dies. Merrell No. 6, 1-in. to 6-in. new dies and cutoff blade. $20.00 f. o. b. First check takes it. J. L. Mudd, Edina, Mo. 11-25/12-2

Miscellaneous

WANTED BRASS GOODS — SOME eastern brass goods manufacturer of quick pression bibbs, basin and bath cocks, desiring exclusive representative on the Pacific Coast will please address 674, "Domestic Engineering," 1900 Prairie Ave., Chicago. 11-25/12-2

PATENTS

And Trademarks Secured. Write, phone or call for information. Williamson & Williamson, 1325 Arch St., Philadelphia, Pa.

MANUFACTURER'S AGENCY DEsires additional lines which can be sold to jobbers. We are in a position to promote sales through work with architects. Los Angeles and Southern California. Address 677, "Domestic Engineering," 1900 Prairie Ave., Chicago. 11-25-12-2

We will buy your

UNUSED PIPE COUPLINGS

at attractive prices.

Send us your list.

John W. Moon
1420 Chestnut Street
Philadelphia

U. S. GOVERNMENT UNDERWEAR—2,500,000 pieces New Government Wool Underwear purchased by us to sell to the public direct at 75c **each.** Actual retail value, $2.50 each. All sizes, shirts 34 to 46—Drawers, 30 to 44. Send correct sizes. Pay postman on delivery or send us money order. If underwear is not satisfactory, we will refund money promptly upon request. Dept. 24, The Pilgrim Woolen Co., 1476 Broadway, New York, N. Y. 12-2-tf

ILLUSTRATED BIN LABELS FOR water, gas, and steam fittings and mill supplies. Send for Samples and prices. Haddon Bin Label Co., Haddon Heights, N. J. 10-21tf

USED PIPE MACHINES

25—Jarecki type 400, capacity 1 to 4″. Each machine is furnished with a set of dies with a range from 1 to 4″, pump and cut-off. Each machine is motor driven and complete with a 3 H. P. Motor.

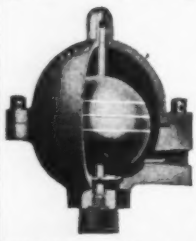
PRICED LOW FOR QUICK SALE

The O'Brien Machinery Co., 113 N. Third Street, Philadelphia, Pa.

HOME COMPLETE EXPOSITION IN Indianapolis under management Real Estate Board will repeat its tremendously successful show April 2 to 7, 1923. Manufacturers of ANYTHING pertaining to home building or furnishing: GET BEFORE INDIANA THROUGH THIS SHOW. For details address J. F. Cantwell, Indianapolis, Ind. 12-2

SELL US YOUR SURPLUS PIPE COUplings. Write us. The A. & J. Mfg. Co., 557 W. Lake St., Chicago. tf

Red Top Relief Valve



A safety appliance you should know

PHILADELPHIA METER CO. Send me complete information about *Red Top Relief Valves.*

Name.....

Address.....

City & State.....

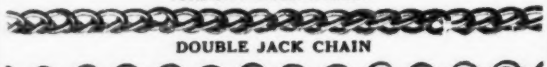
Jobber's Name.....

Philadelphia Meter Co.
942 Real Estate Trust Bldg.
PHILADELPHIA - PA.

PLUMBERS CHAINS

PLUMBERS LINK CHAIN

SAFETY LINK CHAIN



DOUBLE JACK CHAIN

UNIVERSAL CHAIN

THE SMITH & EGGE MFG. CO.
Originators of Sash Chain
BRIDGEPORT, CONN.

Side Step Trouble—Use Eagle *Drawn* Lead Flanges

CATALOGED IN SWEET'S

It is generally accepted without argument that lead roof flanges are best — but be sure to use drawn, not cast lead goods. When you install an Eagle Roof Flange you eliminate any calls back on account of defective material.

The apron is drawn lead to which the boot, made of drawn lead pipe, is lead burned. Top ring being triple thick, and twice spun, is ideal for calking.

The Eagle Roof Flange will fit any pitch of roof and is easily and quickly adjusted.

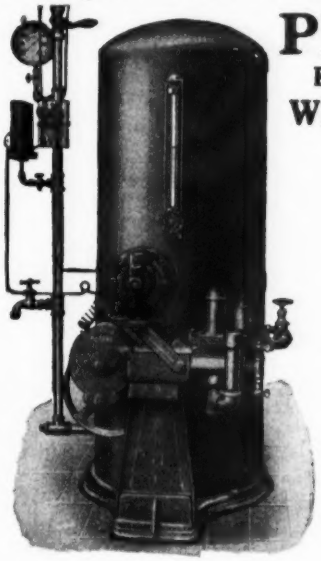
Manufactured exclusively by

The Eagle-Picher Lead Company

CINCINNATI CHICAGO JOPLIN

The Better Water Supply System

This modern outfit is built for real service and makes good wherever installed.



PETERS

Electric-Automatic

WATER SYSTEM

With Electro-Weld Pneumatic Tank on Sub-Base.

Equipped with our latest design back-geared pumping unit having eccentric type connecting rod. All working parts operate in oil bath.

For vertical lift up to 25 ft. Capacity 135 Gals. per hr.

The PETERS line includes just the right outfit for every water supply job.

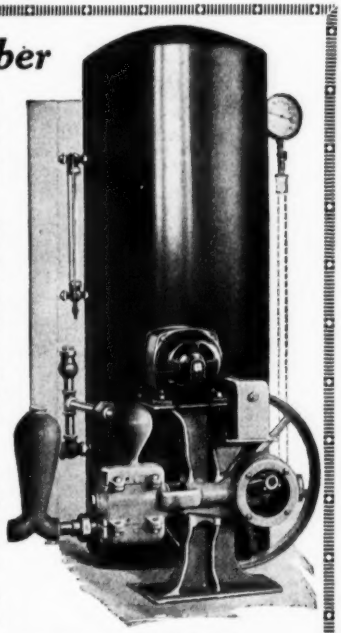
Write for Catalog

Fig. 400 Outfit

Peter's Pump Company

KENDALLVILLE, IND.

Mr. Plumber



DON'T YOU KNOW—that REAL SERVICE is remembered LONG AFTER the bill is paid and forgotten?

That is why after you have installed a UNIFLOW DOMESTIC WATER SYSTEM, the customer's satisfaction with the PERFECT working of the outfit is all he thinks of, and is sure to recommend it to his friends and neighbors.

AND NO WONDER.

Quiet running—perfect lubrication, which increases the life of the pump, and cuts repair costs, and then a CONSTANT saving in power bills.

WHY SHOULDN'T he be pleased with it?

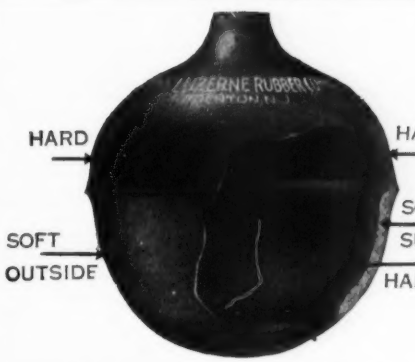
None other can compare with the UNIFLOW.

When remodelling or building, for YOUR OWN PROFIT and SATISFACTION, INSIST ON UNIFLOW PUMPS.

Plumbers Investigate

Uniflow Pump & Mfg. Co.

427 Valley St., Tel. East 47 Dayton, Ohio



EBONITE Tank Valve Balls

THEY will not swell or collapse because they are made of pure hard rubber, yet they always seat perfectly because the surface that makes contact with the valve is soft and resilient.

It would take too long to make a practical test, as the life of an Ebonite Tank Valve Ball is not measured by the same terms as an ordinary ball.

However, they are absolutely guaranteed and we'll gladly send a sample free to any jobber or master plumber.

Ebonite Tank Valve Balls are made in 2½, 2⅝, 2¾ and 3 in. sizes.

The Luzerne Rubber Co.

Trenton, New Jersey

Chicago Office: 564 West Monroe Street

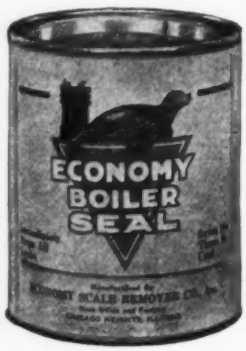
Assures a Tight Job

Before you call a heating installation complete, make it absolutely tight with

Economy Boiler Seal

Just pour a can in the boiler at time test is made and it will find every open place and seal it tight permanently.

The easiest and surest way to locate and stop leaks on old or new jobs. Saves time and money and avoids inconvenience of shutting down plant to repair a cracked or leaky boiler section



Your Jobber carries
ECONOMY
Specify can with the Seal on Label

Mid-West Representative
OSCAR C. ANDERSEN
1702 N. Talman Avenue
Chicago, Ill.

Economy Scale Remover Co., Inc.
Chicago Heights, Illinois

Up-to-date and Thoroughly Practical

Estimate blanks in book form which keeps everything together, reminds you of every item and keeps a detailed record of all jobs.

SIMPLEX ESTIMATE BOOK
FOR MASTER PLUMBERS

An estimate book, worked out by a well-known master plumber and used by him for many years, is now available to you, in book form.

It makes the work of estimating extremely simple, accurate and quick.

50 two-page estimates in a book, bound in paper, size 8½"x11", printed on good bond paper suitable for pen or pencil.

Price, postpaid, only $1.00.

DOMESTIC ENGINEERING
1900 Prairie Ave. - - - - Chicago

Buyers' Directory

AIR CONDITIONING APPARATUS
Clarage Fan Co., Kalamazoo, Mich.

BATHROOM ACCESSORIES
Russell Mfg. Co., John M., Naugatuck, Conn.
Sanitary Specialties Co., Philadelphia.

BATHS, SHOWER
Coyne & Delany Co., Brooklyn.
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Erie Shower Co., Erie, Pa.
Hoffman & Billings Mfg. Co., Milwaukee.
Hudson Brass Works, Brooklyn.
Kenney-Cutting Products Corp., New York City.
Mueller Mfg. Co., H., Decatur, Ill.
Powers Regulator Co., Chicago.
Speakman Co., Wilmington, Del.
Wolff Mfg. Corp., Chicago.
Wolverine Brass Works, Grand Rapids, Mich.

BATH TUBS, ENAMELED IRON
Crane Co., Chicago.
Kohler Co., Kohler, Wis.
Standard San. Mfg. Co., Pittsburgh.
U. S. San. Mfg. Co., Pittsburgh.

BATH TUBS, PORCELAIN
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Trenton Potteries Co., Trenton, N. J.
Wolff Mfg. Co., Chicago.

BENCHES, PIPE, PORTABLE
Martin & Sons, H. P., Owensboro, Ky.
Standard Iron Works, New York.

BENDERS, PIPE
Martin & Sons, H. P., Owensboro, Ky.
Penn Eng. Co., Reading, Pa.
Standard Iron Works, New York.

BENDS, CLOSET
Compound Inj. & Specialty Co., Chicago.
Sanitary Compound of America, Linfield, Pa.

BIN LABELS
Haddon Bin Label Co., Haddon Heights, N. J.

BLOWERS, HEATING AND VENTILATING
Clarage Fan Co., Kalamazoo, Mich.

BOILERS, HEATING, HOT WATER AND STEAM
Abendroth Bros., Port Chester, N. Y.
American Radiator Co., New York.
Burnham Boiler Corp., Irvington, N. Y.
General Boilers Co., Waukegan, Ill.
Gorton & Lidgerwood Co., New York.
Hamburg Boiler Works, Hamburg, Pa.
Herbert Boiler Co., Chicago.
Illinois Malleable Iron Co., Chicago.
International Heater Co., Utica, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Keystone Boiler & Fdy. Co., Landisville, Pa.
Pierce, Butler & Pierce Mfg. Corp., New York.
Smith Co., H. B., Westfield, Mass.

BOILERS, HEATING, HOT WATER AND STEAM, MAGAZINE FEED
American Radiator Co., New York.
Central Radiator Co., New York City.
Gorton & Lidgerwood Co., New York.
Herbert Boiler Co., Chicago.
Pierce, Butler & Pierce Mfg. Corp., New York.
Wayne Heater Corp., Richmond, Ind.
Wilks Mfg. Co., S., Chicago.

BOWLS, WATER CLOSET
Chicago Pottery Co., Chicago.
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Kalamazoo Sanitary Mfg. Co., Kalamazoo, Mich.
Kohler Co., Kohler, Wis.
Maddock & Sons, John, Trenton.
Maddock's Sons Co., Thos., Trenton, N. J.
Standard San. Mfg. Co., Pittsburgh.
Trenton Potteries Co., Trenton, N. J.
Wolff Mfg. Corp., Chicago.
Zwermann Co., Robinson, Ill.

BRACKETS OR HANGERS, RADIATOR
A. F. Gleockle, Jr., Rochester, N. Y.
Hartmann Co., Chas., Brooklyn.
Healy-Ruff Co., Minneapolis, Minn.

BRACKETS, SINK
Illinois Malleable Iron Co., Chicago.
Riverside Foundry & Galv. Co., Kalamazoo, Mich.
Sanitary Company of America, Linfield, Pa.

BRASS GOODS, GAS
Crane Co., Chicago.
Haydenville Co., Haydenville, Mass.
Mueller Mfg. Co., H., Decatur, Ill.

BRASS GOODS, PLUMBERS'
Acme Brass Works, Detroit.
American Pin Co., Waterbury, Conn.
American Sanitary Mfg. Co., Abingdon, Ill.
Beneke & Kropf Mfg. Co., Chicago.
Capitol Brass Works, Detroit.
Central Brass Mfg. Co., Cleveland.
Chicago Faucet Co., Chicago.
Cleveland Brass Mfg. Co., Cleveland, O.
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Haydenville Co., Haydenville, Mass.
Hays Mfg. Co., Erie, Pa.
Hudson Brass Works, Brooklyn.
McRae & Roberts Co., Detroit.
McShane Bell Fdry Co., Baltimore.
Mueller Mfg. Co., H., Decatur, Ill.
Perkes Co., Charles, Philadelphia.
Rudolph Co., A. J., Philadelphia.
Savill's Sons, Thos., Philadelphia.
Speakman Co., Wilmington, Del.
Union Brass & Metal Mfg. Co., St. Paul.
Waterbury Mfg. Co., Waterbury, Conn.
Wise, Inc., J. B., Watertown, N. Y.
Wolverine Brass Works, Grand Rapids, Mich.
Wolff Mfg. Corp., Chicago.
Woodward-Wanger Co., Philadelphia.

BRASS GOODS, STEAM
Capitol Brass Works, Detroit.
Crane Co., Chicago.
Fulton Company, Knoxville, Tenn.
Haydenville Co., Haydenville, Mass.
Jenkins Bros., New York.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Ohio Brass Co., Mansfield, O.
Penberthy Injector Co., Detroit.
Perkes Co., Charles, Philadelphia.

BRASS GOODS, WATER
Capitol Brass Works, Detroit.
Crane Co., Chicago.
Haydenville Co., Haydenville, Mass.
Jenkins Bros., New York.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Mueller Mfg. Co., H., Decatur, Ill.
Ohio Brass Co., Mansfield, O.
Penberthy Injector Co., Detroit.
Perkes Co., Charles, Philadelphia.
Trenton Brass and Machine Co., Trenton, N. J.
Union Brass & Metal Mfg. Co., St. Paul.
Wolverine Brass Works, Grand Rapids, Mich.
Woodward-Wanger Co., Philadelphia.

BURNERS, GARBAGE
General Boilers Co., Waukegan, Ill.
Illinois Malleable Iron Co., Chicago.
Kewanee Boiler Co., Kewanee, Ill.
Wilks Mfg. Co., S. Chicago.

CABINETS, MEDICINE
Beneke & Kropf Mfg. Co., Chicago.
Hess Warming & Ventilating Co., Chicago.

CATCH BASINS, ACID PROOF
Duriron Co., Inc., Dayton, O.

CATCH BASINS, CAST IRON
Compound Inj. & Spec. Co., Chicago.
Illinois Malleable Iron Co., Chicago.
Wade-Iron San. Mfg. Co., Chicago.

CEMENT, IRON
Chard & Howe, New York City.
Kemoshyne Products, Inc., Camden, N. J.
Smooth-On Mfg. Co., Jersey City.

CESSPOOLS, CAST-IRON
Estabrook's Sons, R., So. Boston.
Jones Hollow Ware Co., Baltimore, Md.
Sanitary Company of America, Linfield, Pa.

What We Want To Do For You

We want to make you a *Water and Light* Expert.

We want to *advertise you* as an expert to every prospective water or light system buyer in you community.

We want to hand over to you BIG PROFITS—just as we are handing them over to thousands of dealers all the time.

We want you to handle the famous systems that deliver water *direct from the well*—Milwaukee Air Power Water Systems. No storage tank where water gets stale and warm.

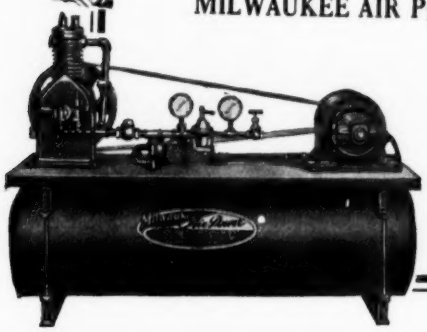
We want you to give your customers the chance to buy the most economical, simple and efficient water systems in the world—a size and type and price for every need—for deep wells or shallow.

They *want* to buy—they *will* buy—you profit.

We want you to get the benefit of our national advertising that is bringing big sales to farms, country homes, institutions and schools.

We want you to write us for full particulars—today!

MILWAUKEE AIR POWER PUMP CO., 890 Third St., Milwaukee, Wis.



Milwaukee Air Power WATER LIGHT Systems

Do You Appreciate Your Bathroom?

The quality goes in—

WHITAKER-GLESSNER CO. WHITAKER PORTSMOUTH OHIO

before the label goes on

RANGE WHITAKER BOILERS

Wheeling Steel Products Co.
Wheeling, W. Va.

Exclusive Sales Agents for
Whitaker-Glessner Co., Wheeling Steel & Iron Co., and La Belle Iron Works

SUPPOSE you were suddenly deprived of its many conveniences and were forced to go back to the conditions that existed before its introduction into the household. You would certainly find yourself at a great disadvantage and loss.

The great success of the indispensable bathroom is due largely to the hot water supply. Without the many gallons of it your bathtub, sinks, etc., are practically useless.

Therefore, it stands to reason that your Range Boiler (the source of hot water) should be the best possible in order to keep the bathroom functioning properly.

Thousands of satisfied users of WHITAKER Range Boilers are ready to vouch for their dependable qualities. They have learned from long use that nothing but the best material and workmanship goes into their construction. We make the material ourselves and know it is good; we also immerse the boiler, after completion, into the galvanizing fluid, rendering it practically immune from corrosive action.

Order WHITAKER Boilers from your jobber or write us for quotations.

The
WILEY SAFETY VENT VAPOR REGULATOR

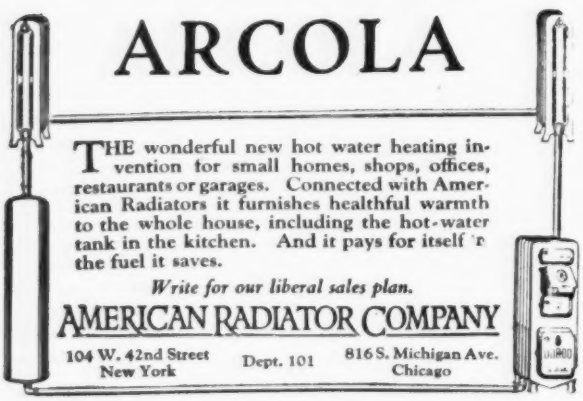
Provides the best

LIFE AND ACCIDENT INSURANCE for your vapor heating boiler

A peerless quality product manufactured and sold exclusively by

The Simplex Heating Specialty Co., Inc.
Lynchburg, Va.

ARCOLA

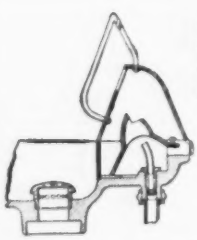


THE wonderful new hot water heating invention for small homes, shops, offices, restaurants or garages. Connected with American Radiators it furnishes healthful warmth to the whole house, including the hot-water tank in the kitchen. And it pays for itself in the fuel it saves.

Write for our liberal sales plan.

AMERICAN RADIATOR COMPANY

104 W. 42nd Street New York — Dept. 101 — 816 S. Michigan Ave. Chicago



PURO LIBERTY Drinking Fountains

Are the only Absolutely Sanitary Fountains on the Market

Ask us for catalogs and prices

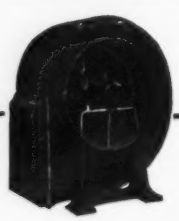
Puro Sanitary Drinking Fountain Co.
Haydenville, Mass.

CLARAGE
KALAMAZOO

MULTIBLADE FANS

for Heating, Ventilating and Humidifying Service are installed in many of the largest buildings throughout this country.

CLARAGE FAN CO.
Kalamazoo Michigan



Write for Catalog

Our catalog No. 32 is just off the press. It contains valuable information for the Heating and Ventilating Contractor. Send for your copy today.

Buyers' Directory

CHAINS, PLUMBERS'
Russell Mfg. Co., John M., Naugatuck, Conn.
Smith & Egge Mfg. Co., Bridgeport, Conn.

CLEANING COMPOUNDS
Chamberlain Co., Pittsburgh, Pa.
Hercules Chemical Co., New York.
Kemoshyne Products, Inc., Camden, N. J.
Porcela-Radax Co., New Brighton, Pa.

CLEAN-OUTS, CAST-IRON
Blake Specialty Co., Rock Island, Ill.
Compound Inj. & Specialty Co., Chicago.
Estabrook's Sons, R., So. Boston.
Sanitary Company of America, Linfield, Pa.

CLOCKS, BOILER AND FURNACE
Tillery's Little Janitor Clock Co., Newark, N. J.

COCKS, BALL
American Pin Co., Waterbury, Conn.
Burlington Brass Works, Burlington, Wis.
Douglas Co., John, Cincinnati.
Frost Mfg. Co., Kenosha, Wis.
Haydenville Co., Haydenville, Mass.
Illinois Malleable Iron Co., Chicago.
McShane Bell Fdry. Co., Baltimore.
Morency-Van Buren Mfg. Co., Sturgis, Mich.
Mueller Mfg. Co., H., Decatur, Ill.
Sherwood Brass Works, Detroit.
Union Brass & Metal Mfg. Co., St. Paul.
Wolverine Brass Works, Grand Rapids, Mich.
Woodward-Wanger Co., Philadelphia.

COCKS, GAUGE
Capitol Brass Works, Detroit.

COCKS, LAUNDRY TRAY
Burman Specialty Co., Minneapolis.
Capitol Brass Works, Detroit.
E-Z Mfg. Co., Minneapolis.
Savill's Sons, Thos., Philadelphia.

COMPOUNDS, BOILER SEALING
Boiler Sealtite Co., Chicago.
Economy Scale Remover Co., Chicago Heights, Ill.
Hollingshead Co., R. M., Camden, N. J.
Kemoshyne Products, Inc., Camden, N. J.
Shur-Tite Mfg. Co., Norwood, Cincinnati, Ohio.
Smooth-On Mfg. Co., Jersey City, N. J.
"X" Laboratories, New York.

COUPLINGS, UNION
Capitol Brass Works, Detroit.
Crane Co., Chicago.
Illinois Malleable Iron Co., Chicago.
Woodward-Wanger Co., Philadelphia.

CURTAINS, SHOWER BATH
Sanitary Bath Curtain Mfg. Co., New York City.

CUTTERS, PIPE
Armstrong Mfg. Co., Bridgeport, Conn.
Borden Co., Warren, O.
Crown Die & Tool Co., Chicago.
Duriron Co., Inc., Dayton, O.
Greenfield Tap & Die Corp., Greenfield, Mass.
Mechanicville Specialty Supply Mfg. Co., Mechanicville, N. Y.
Nye Tool & Mach. Works, Chicago.
Toledo Pipe Threading Machine Co., Toledo, O.
Woodward-Wanger Co., Philadelphia.

DRAINERS, CELLAR
Haydenville Co., Haydenville, Mass.
Kemp Mfg. Co., C. M., Baltimore.
Penberthy Injector Co., Detroit.

DRAINS, FLOOR, ACID PROOF
Duriron Co., Inc., Dayton, O.

DRAINS, FLOOR AND GARAGE
Blake Specialty Co., Rock Island, Ill.
Compound Inj. & Specialty Co., Chicago.
Crampton-Farley Brass Co., Kansas City, Mo.
Douglas Co., John, Cincinnati.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Sanitary Company of America, Linfield, Pa.
Wade Iron San. Mfg. Co., Chicago.

DRAINS, REFRIGERATOR
Blake Specialty Co., Rock Island, Ill.
Compound Inj. & Spec. Co., Chicago.
Riverside Foundry & Galv. Co., Kalamazoo, Mich.
Sanitary Company of America, Linfield, Pa.

DRAINS, SHOWER
Blake Specialty Co., Rock Island, Ill.
Compound Inj. & Spec. Co., Chicago.
Sanitary Company of America, Linfield, Pa.
Speakman Co., Wilmington, Del.

ELECTRIC LIGHT AND POWER PLANTS
Fairbanks, Morse & Co., Chicago.
Holt Power Light Co., Detroit.
Kohler Co., Kohler, Wis.

ENGINES, HOT AIR PUMPING
Rider-Ericsson Engine Co., New York City.

FANS, HEATING AND VENTILATING
Clarage Fan Co., Kalamazoo, Mich.

FERRULES
Douglas Co., John, Cincinnati.
Eagle-Picher Lead Co., Cincinnati.
Haydenville Co., Haydenville, Mass.
Illinois Malleable Iron Co., Chicago.
Mechanicville Specialty Supply Mfg. Co., Mechanicville, N. Y.
Mueller Mfg. Co., H., Decatur, Ill.
Raymond Lead Works, Chicago.
Rudolph Co., A. J., Philadelphia.
Russell Mfg. Co., John M., Naugatuck, Conn.
Sanitary Company of America, Linfield, Pa.
Savill's Sons, Thos., Philadelphia.

FITTINGS, LEAD
Raymond Lead Works, Chicago.

FITTINGS, PIPE, BRASS
Crane Co., Chicago.
Haydenville Co., Haydenville, Mass.
Mueller Mfg. Co., H., Decatur, Ill.
Perkes Co., Charles, Philadelphia.
Walworth Mfg. Co., Boston.
Wolverine Brass Works, Grand Rapids, Mich.

FITTINGS, PIPE, MALLEABLE
Crane Co., Chicago.
Grabler Mfg. Co., Cleveland.
Illinois Malleable Iron Co., Chicago.
Walworth Mfg. Co., Boston.

FIXTURES, BATH, SUPPLY AND WASTE
American Pin Co., Waterbury, Conn.
Beneke & Kropf Mfg. Co., Chicago.
Crane Co., Chicago.
Haydenville Co., Haydenville, Mass.
Mueller Mfg. Co., H., Decatur, Ill.
Speakman Co., Wilmington, Del.
Wise, Inc., J. B., Watertown, N. Y.
Wolverine Brass Works, Grand Rapids, Mich.
Woodward-Wanger Co., Philadelphia.

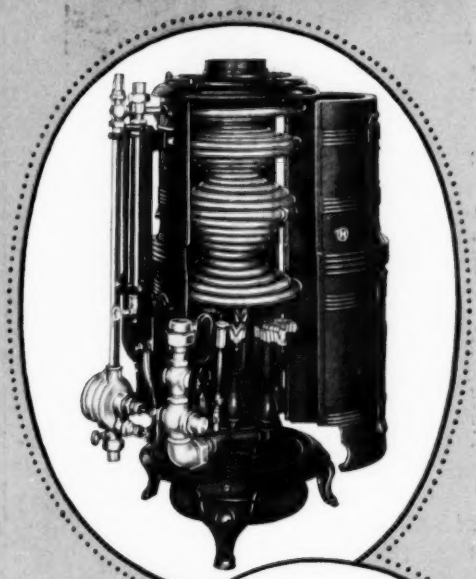
FLANGES, CLOSET, SHORT HORN
Groeniger Mfg. Co., Columbus, O.
Rudolph Co., A. J., Philadelphia.

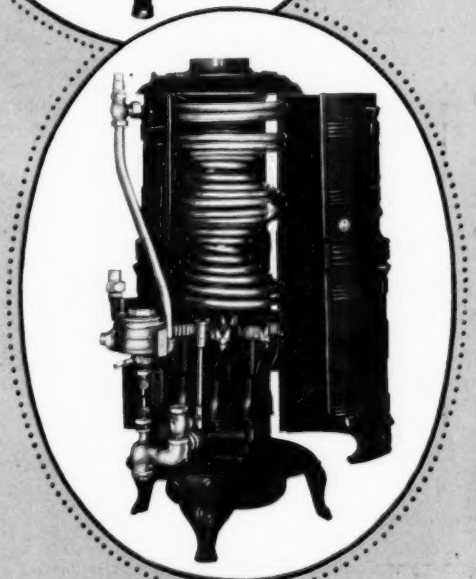
FLANGES, ROOF
Barrett Co., New York City.
Bullard Specialty Co., Tiffin, O.
Butler Mfg. Co., Minneapolis.
Eagle-Picher Lead Co., Cincinnati.
Harker Mfg. Co., Cincinnati.
Hessler Co., H. E., Syracuse, N. Y.
Midland Metal Mfg. Co., Kansas City, Mo.
Raymond Lead Works, Chicago.
Simplex Mfg. Co., Chicago.

FLOATS, COPPER
Haydenville Co., Haydenville, Mass.
Wolverine Brass Works, Grand Rapids, Mich.

FOUNTAINS, DRINKING
Acme Brass Works, Detroit.
Central Brass Mfg. Co., Cleveland.
Chicago Faucet Co., Chicago.
Chicago Pottery Co., Chicago.
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Imperial Brass Mfg. Co., Chicago.
Haydenville Co., Haydenville, Mass.
Kohler Co., Kohler, Wis.
Mueller Mfg. Co., H., Decatur, Ill.
Puro Sanitary Drinking Fountain Co., Haydenville, Mass.
Standard San. Mfg. Co., Pittsburgh.
U. S. San. Mfg. Co., Pittsburgh.
Wolff Mfg. Corp., Chicago.

HOFFMAN
Instantaneous Automatic Water Heaters





Note These Advantages

THE four new Hoffman Instantaneous Automatic Water Heaters are especially designed and constructed for small homes. They offer this type of home all of the hot water advantages formerly limited to larger residences.

They are made in two models and in two sizes—thermostatic heaters and pressure valve heaters, each model including a 2½ and a 3 gallons per minute capacity heater. The thermostatic heaters are Nos. 55 and 80. The pressure valve heaters are Nos. 52 and 70. See table at bottom of page.

Nos. 55 and 80 have the same thermostat and valve equipment used on the larger Hoffman Automatics. All four of the new heaters are equipped with the latest Hoffman improvements. Only the best materials have been used and the workmanship is up to Hoffman standards.

These heaters are easily installed, using a ¾-inch gas supply, and will operate on a ten light meter. And finally these heaters are priced below comparable types—prices that mean easy sales.

Write us at once for full information, including prices, etc. The opportunity is too good to permit of delay.

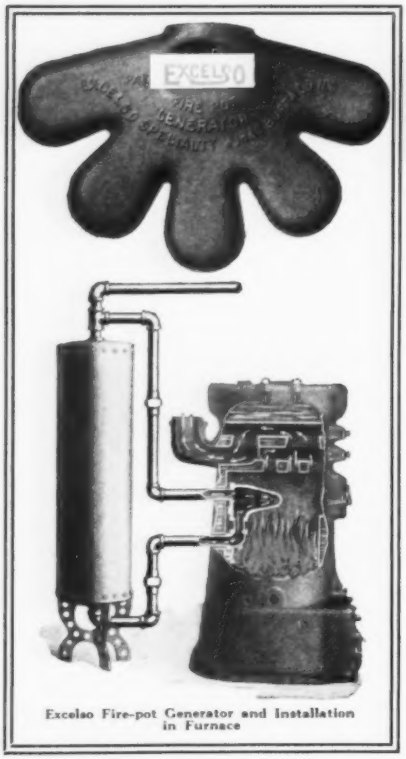
The Hoffman Heater Company
1315 Oberlin Avenue Lorain, Ohio

Branches in all important centers

The Hoffman Heater Company is an independent organization, not affiliated with any other heater company, paying no royalties.

Dimensions, Weights, Etc.

No.	Capacity in Gallons per Minute	Height Inches	Size of Gas Inlet	Size of Gas Meter	Flue Connection	Shipping Weight Pounds
55	2½	35	¾″	10 lt.	5″	175
80	3	39	¾″	10 lt.	5″	200
52	2½	35	¾″	10 lt.	5″	175
70	3	39	¾″	10 lt.	5″	200



Excelso Fire-pot Generator and Installation in Furnace

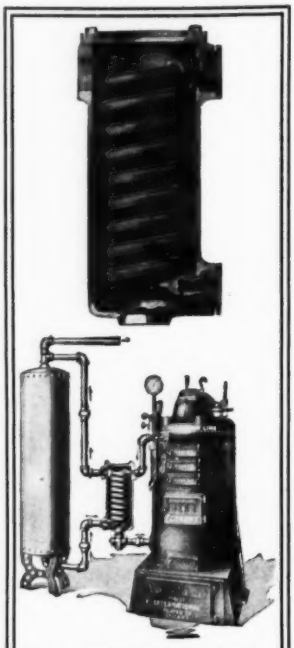
YOUR SELLING OPPORTUNITY INCREASED

EXCELSO WATER HEATERS

For All Types of Heating Plants

Hot Water or Hot Air Systems

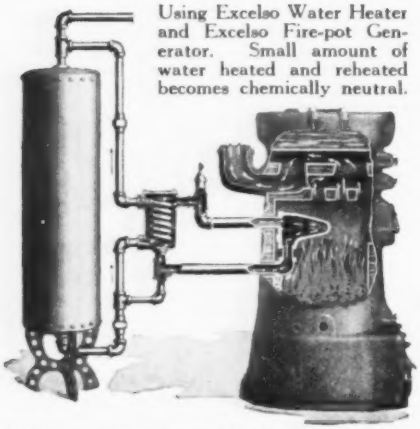
Excelso Fire-pot Generators are daily proving possibilities of building up a profitable business. Give your customers the economical method of heating water with their heating plants. Adaptable for any hot air or hot water furnaces. No interference with combustion of fuel—occupies small space. Cast iron or brass; two sizes. Send for particulars and low prices.


Excelso Water Heater and Installation Between Storage Tank and Boiler

Steam or Vapor Systems

The famous Excelso Water Heater connects on the outside of any steam or vapor heating boiler. Patented ground joints eliminate leaks. Sold and recommended by all the leading boiler manufacturers. There can be no come-back on the plumber with Excelsos—guaranteed or purchase price refunded. Thousands in use—a guarantee of their dependability and economy. The original indirect heater.

To Reduce Lime Deposits


Using Excelso Water Heater and Excelso Fire-pot Generator. Small amount of water heated and reheated becomes chemically neutral.

Installation of Generator and Water Heater to Reduce Lime Deposits

Sales Helps—Free Literature, Display Cards, Advertising Cuts

Excelso Advertising appearing every other week in **Saturday Evening Post,** and every month in **Good Housekeeping, American Magazine** and other consumer publications helps you to build up a profitable business. We furnish, absolutely free, window displays, leaflets, newspaper cuts, and will circularize your mailing lists. Write today for full particulars, discounts, etc.

EXCELSO SPECIALTY WORKS, 111 Clinton St., Buffalo, N. Y.

Special New York Sales Representative John G. Kelly, 137 East 43rd St.

New England Representative Daniel L. Hanson, 46 Cornhill, Boston, Mass.

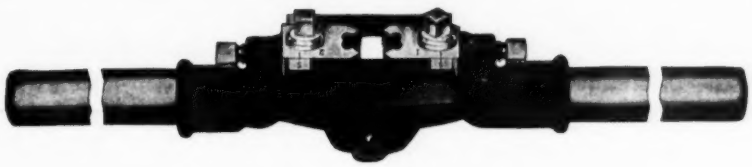
Geo. E. Kitson Co., 5029 Chester Ave., Philadelphia, Pa.

Western Sales Representative—C. N. Stedman, Wrigley Bldg., Chicago, Ill.

EXCELSO WATER HEATERS

Sold by All Plumbers and Steamfitters

ARMSTRONG PIPE THREADING TOOLS



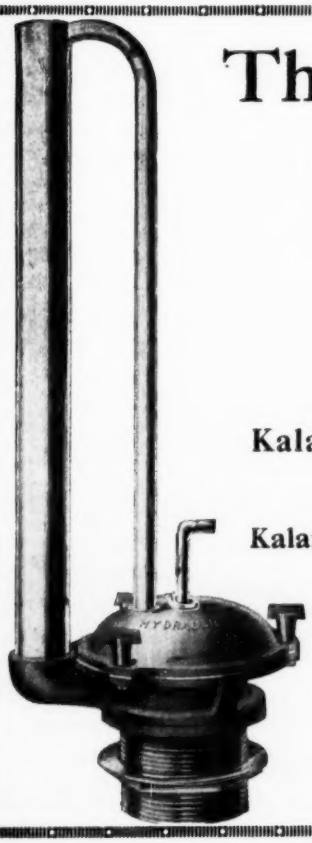
Armstrong Adjustable Pipe Stocks are so simple in construction, there is not much to say about them in the way of description. They are 100% efficient in service.

Your jobber can supply you with Armstrong Tools.

The Armstrong Mfg. Co.

Main Office and Factory: 284 Knowlton St., Bridgeport, Conn.

New York Office: 248 Canal Street



The Hydraulic—Excellent *of* Flush Valve Perfection

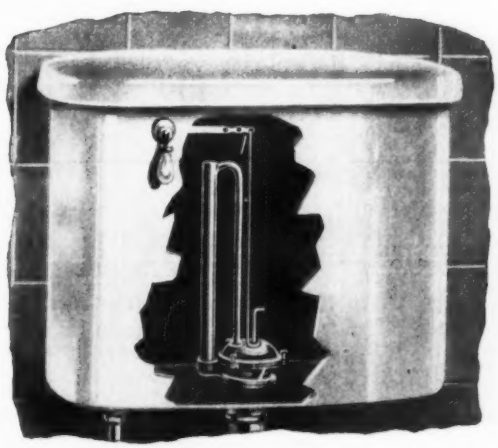
Are you one of the many who sell them?

If not!—Why not?

Ask for quotations. Place orders now.

Kalamazoo Sanitary Mfg. Co.

Kalamazoo Michigan



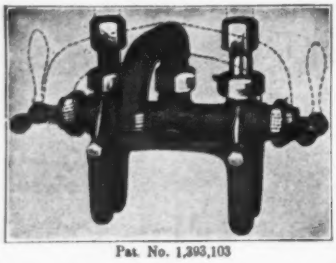
M.-V. B.

Closet Tank fittings are not the cheapest and are used by Manufacturers who want the best.

LOOK IN THE TANK

Ballcocks, Flush Valves, Hinges, Flush Levers, Etc.

Morency-Van Buren Mfg. Co.
Sturgis - - Michigan



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E-Z Faucet
FOR LAUNDRY TRAYS

All brass with standard half inch unions and couplings with hot and cold connections, quick compression valves. Swinging nozzle for 2 or 3 part tub. Clamp quickly engages tub. A sale with every laundry installation.

Send for Circular. **THE E-Z MFG. CO.**
714 Builders Exchange MINNEAPOLIS, MINN.

"American" Bent Tube Adjustable Trap

With P. O. Plug or Sink Connection

TRADE A-S-M-Co Quality Durability MARK

A trap that always gives the service expected of it.

Like all goods bearing our trade mark, this trap is high class in every respect.

Sizes 1¼ and 1½-inch.
Order from your jobber.

American Sanitary Mfg. Co.
ABINGDON, ILLINOIS
Manufacturers of Fine N. P. Brass Specialties.

TABASCO
WATER HEATERS

are hot stuff. And they are *built of steel* in the the same fine manner as the famous Kewanee Boilers

KEWANEE BOILER COMPANY
Kewanee, Ill.

Buyers' Directory

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Clayton & Lambert Mfg. Co., Detroit.
Detroit Torch & Mfg. Co., Detroit.
Double Blast Mfg. Co., N. Chicago.
Turner Brass Works, Sycamore, Ill.

GASOLINE STORAGE SYSTEMS
Goulds Mfg. Co., Seneca Falls, N. Y.
Koven & Bro., L. O., New York.

GAUGES, STEAM AND ALTITUDE
Capitol Brass Works, Detroit.
Imperial Brass Mfg. Co., Chicago.

GAUGES, WATER
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Capitol Brass Works, Detroit.
Ohio Brass Co., Mansfield, O.
Penberthy Injector Co., Detroit.
Penn Engineering Co., Philadelphia

GASKETS
Wolverine Brass Works, Grand Rapids, Mich.

GENERATORS, STEAM
Wilks Mfg. Co., S. Chicago.

HANGERS, PIPE
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bishop & Babcock Co., Cleveland.
Crane Co., Chicago.
Illinois Malleable Iron Co., Chicago.
Penn Engineering Co., Philadelphia
Riverside Fdry & Galv. Co., Kalamazoo, Mich.
Wolverine Brass Works, Grand Rapids, Mich.

HEATERS, WATER AUXILIARY
Davidson Heating & Const. Co., Hanover, Pa.
Excelso Specialty Wks., Buffalo.
Hotstream Heater Co., Cleveland.
Thermal Appliance Co., New York.

HEATERS, GARAGE
Keystone Boiler & Fdy. Co., Landisville, Pa.
Wilks Mfg. Co., S. Chicago.

HEATERS, LAUNDRY
Abendroth Bros., Port Chester, N.Y.
American Radiator Co., New York.
Burnham Boiler Corp., Irvington N. Y.
Gorton & Lidgerwood Co., New York.
Herbert Boiler Co., Chicago.
Illinois Malleable Iron Co., Chicago.
International Heater Co., Utica, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Pierce, Butler & Pierce Mfg. Corp., New York.

HEATERS, WATER, COAL, BRASS COIL
Cleghorn Co., Boston, Mass.

HEATERS, WATER COAL
Abendroth Bros., Port Chester, N. Y.
American Radiator Co., New York.
Gorton & Lidgerwood Co., New York.
Herbert Boiler Co., Chicago.
Illinois Malleable Iron Co., Chicago.
International Heater Co., Utica, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Pierce, Butler & Pierce Mfg. Corp., New York.
Wilks Mfg. Co., S. Chicago.

HEATERS, WATER, GAS
Ever Hot Heater Co., Detroit.
Hoffman Heater Co., Lorain, O.
Hotstream Heater Co., Cleveland.
Humphrey Co., Kalamazoo, Mich.
Ohio Heater Co., Columbus, O.
Riverside Boiler Wks., Cambridge, Mass.

HEATERS, WATER, INDIRECT
American District Steam Co., N. Tonawanda, N. Y.
Davidson Heating & Const. Co., Hanover, Pa.
Excelso Specialty Wks., Buffalo.
Hotstream Heater Co., Cleveland.
Keystone Boiler & Fdy. Co., Landisville, Pa.
Riverside Boiler Wks., Cambridge, Mass.
Thermal Appliance Co., New York.
Whitlock Coil Pipe Co., Hartford, Conn.

HEATERS, WATER, KEROSENE
Hotstream Heater Co., Cleveland.

HEATERS, WATER, STEAM
American District Steam Co., No. Tonawanda, N. Y.
Central Radiator Co., New York.
Excelso Specialty Works, Buffalo.
Hotstream Heater Co., Cleveland.
Keystone Boiler & Fdy. Co., Landisville, Pa.
Thermal Appliance Co., New York.

HEATERS, WATER, STORAGE
EverHot Heater Co., Detroit.
Hoffman Heater Co., Lorain, O.
Riverside Boiler Wks., Cambridge, Mass.
Thermal Appliance Co. New York.
Wales Co., The, Kalamazoo, Mich.
Wilks Mfg. Co., S. Chicago.

HEATING SPECIALTIES, HOT WATER
Bishop & Babcock Co., Cleveland.
Fulton Company, Knoxville, Tenn.
Minneapolis Heat Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Chicago.
Reading Heater & Supply Co., Reading, Pa.

HEATING SPECIALTIES, STEAM
Bishop & Babcock Co., Cleveland.
Crane Co., Chicago.
Fulton Company, Knoxville, Tenn.
Illinois Engineering Co., Chicago.
Lytton Mfg. Corp., Franklin, Va.
Minneapolis Heat Regulator Co., Minneapolis, Minn.
O-E Specialty Mfg.Co., Milwaukee.
Sterling Eng. Co., Milwaukee.

HEATING SPECIALTIES, VACUUM AND VAPOR
American District Steam Co., No. Tonawanda, N. Y.
Bishop & Babcock Co., Cleveland.
Fulton Company, Knoxville, Tenn.
Illinois Engineering Co., Chicago.
O-E Specialty Mfg. Co., Milwaukee.
Penberthy Injector Co., Detroit.
Sterling Eng. Co., Milwaukee.
Trane Co., La Crosse, Wis.

HUMIDITY CONTROL
Fulton Company, Knoxville, Tenn.
Powers Regulator Co., Chicago.

HYDRANTS
Haydenville Co., Haydenville, Mass.
Illinois Malleable Iron Co., Chicago.
Kemp Mfg. Co., C. M., Baltimore.
Mueller Mfg. Co., H., Decatur, Ill.

INGOT METAL
Hartman Ingot Metal Co., Chicago.

INJECTORS
Penberthy Injector Co., Detroit.

LAVATORIES, ENAMELED IRON
Crane Co., Chicago.
Jones Hollow Ware Co., Baltimore, Md.
Kohler Co., Kohler, Wis.
Standard San. Mfg. Co., Pittsburgh.
U. S. Sanitary Mfg. Co., Pittsburgh.
Wolff Mfg. Corp., Chicago.

LAVATORIES, PORCELAIN
Crane Co., Chicago.
Wolff Mfg. Corp., Chicago.

LAVATORIES, VITREOUS CHINA
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Maddock's Sons Co., Thos., Trenton, N. J.
Standard San. Mfg. Co., Pittsburgh.
Trenton Potteries Co., Trenton, N. J.
Wolff Mfg. Corp., Chicago.

LEAD FOR PLUMBERS
Eagle-Picher Lead Co., Cincinnati.
Raymond Lead Works, Chicago.

LEGS, LAUNDRY TRAY
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Riverside Fdry & Galv. Co., Kalamazoo, Mich.
Sanitary Company of America, Linfield, Pa.

LEGS, SINK
Illinois Malleable Iron Co., Chicago.
Sanitary Company of America, Linfield, Pa.

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Imperial Brass Mfg. Co., Chicago.

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Hoffmann & Billings Mfg. Co., Milwaukee, Wis.
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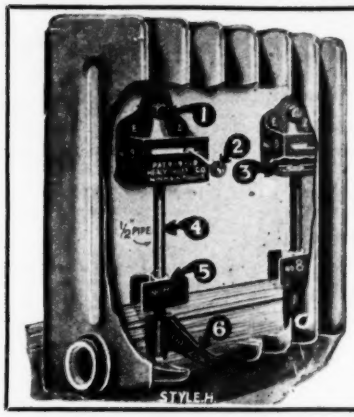

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SPECIAL FEATURES:

Only one bolt in the wall — Both horizontal and vertical adjustment
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E-Z Hangers are easiest to adjust and make a good, permanent job. ***Write for details and prices.***

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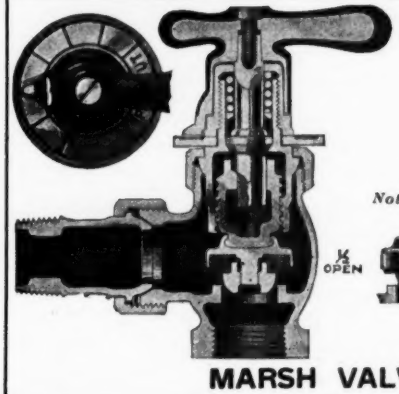
STYLE H
Without Baseboard Adjustment

MARSH
RE-ENFORCED MODULATED
VALVES



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Backed by 40 Years' Experience

Why put a noisy ball cock into a closet tank that is sure to be an annoyance as long as it lasts?

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is quiet in operation, so simple there is nothing to go wrong, and made of materials that give durable service.

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Toledo Pipe Threading Machine Co., Toledo, O.

PIPE CUTTING AND THREADING MACHINERY
Armstrong Mfg. Co., Bridgeport, Conn.
Bignall & Keeler Mch. Works, Edwardsville, Ill.
Borden Co., Warren, O.
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PIPE HOOKS AND STRAPS
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PIPE AND FITTINGS, SOIL, CAST IRON
Abendroth Bros., Port Chester, N.Y.
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Johnson Co., J. D., Mount Holly, N. J.
Krupp Foundry Co., Lansdale, Pa.
National Fdy. Co. of N. Y., Inc., Brooklyn, N. Y.
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Somerville Iron Works, Somerville, N. J.
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Weisikittel & Son Co., A., Baltimore, Md.

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Chase Metal Works, Waterbury, Conn.
Copper & Brass Research Assn., New York City.

PIPE THAWERS, ELECTRIC
General Electric Co., Schenectady, N. Y.

PIPE, WROUGHT
National Tube Co., Pittsburgh.

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Crane Co., Chicago.
Grabler Mfg. Co., Cleveland.
Penn Engineering Co., Philadelphia
Russell & Co., W. A., New York.
Wolverine Brass Works, Grand Rapids, Mich.

POSTS, PIPE VISE
Penn Eng. Co., Reading, Pa.

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Goulds Mfg. Co., Seneca Falls, N. Y.
Humphreys Mfg. Co., Mansfield, O.
Leader-Trahern Co., Decatur, Ill.
Milwaukee Air Power Pump Co., Milwaukee.
Monarch Eng. Co., Dayton, O.
Myers & Bro. Co., F. E., Ashland, O.
Peters Pump Co., Kewanee, Ill.
Rider-Ericsson Engine Co., New York City.
Uniflow Pump & Mfg. Co., Dayton, Ohio.

PUMPS, CONDENSATION, ELECTRIC
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Rider-Ericsson Engine Co., New York City.
Trane Co., La Crosse, Wis.

PUMPS, FORCE
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Duro Pump & Mfg. Co., Dayton, O.
Goulds Mfg. Co., Seneca Falls, N. Y.
Humphreys Mfg. Co., Mansfield, O.
Monarch Eng. Co., Dayton, O.
Myers & Bro. Co., F. E., Ashland, O.
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Newark Brass Wks., Newark, N. J.
Perkes Co., Charles, Philadelphia.
Peters Pump Co., Kewanee, Ill.

PUMPS, TEST
Perkes Company, Charles, Philadelphia.

PUMPS, VACUUM
Bishop & Babcock Co., Cleveland.
Goulds Mfg. Co., Seneca Falls, N. Y.
Illinois Engineering Co., Chicago.
Imperial Brass Mfg. Co., Chicago.
O-E Specialty Mfg. Co., Milwaukee, Wis.

RADIATOR FOOT RAILS
Beaton & Cadwell Mfg. Co., New Britain, Conn.

RADIATORS
American Radiator Co., New York.
Central Radiator Co., New York City.
Kewanee Boiler Co., Kewanee, Ill.
Pierce, Butler & Pierce Mfg. Corp., New York.
Smith Co., H. B., Westfield, Mass.

RADIATORS, GAS HEATED
Ra-Do Radiator & Sales Corp., Philadelphia.

RANGE BOILERS, COPPER
Gerstein Bros. & Cooper, S. Boston.
Hayes Mfg. Co., Paterson, N. J.

RANGE BOILERS, GALVANIZED
Detroit Range Boiler & Steel Barrel Co., Detroit.
Koven & Bro., L. O., New York.
Riverside Boiler Wks., Cambridge, Mass.
Wheeling Steel Products Co., Wheeling, W. Va.
Wolff Mfg. Corp., Chicago.
Wood Mfg. Co., John, Conshohocken, Pa.

RANGES, HOUSE HEATING
Zimmerman Stove Heater Corp. New York, N. Y.

REAMERS, PIPE
Armstrong Mfg. Co., Bridgeport, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
Mueller Mfg. Co., H., Decatur, Ill.

REGULATORS, DAMPER
American District Steam Co., No. Tonawanda, N. Y.
Bishop & Babcock Co., Cleveland.
Fulton Company, Knoxville, Tenn.
Minneapolis Heat Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Chicago.
Sterling Engineering Co., Milwaukee, Wis.

REGULATORS, HOT WATER
Bishop & Babcock Co., Cleveland.
Fulton Company, Knoxville, Tenn.
Illinois Engineering Co., Chicago.
Minneapolis Heat Regulator Co., Minneapolis, Minn.
Mueller Mfg. Co., H., Decatur, Ill.
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Fulton Company, Knoxville, Tenn.
Minneapolis Heat Regulator Co., Minneapolis, Minn.
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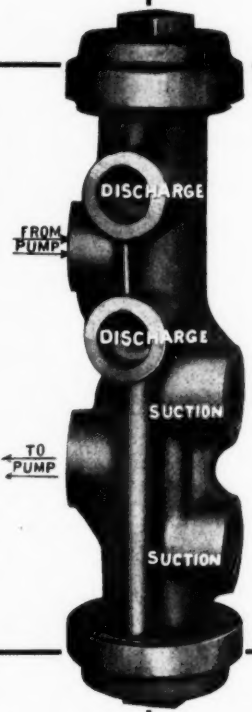
REGULATORS, TEMPERATURE AND RADIATOR COVERS
Fulton Company, Knoxville, Tenn.

RESTS, PIPE
Blake Specialty Co., Rock Island, Ill.
Walworth Mfg. Co., Boston.



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Hard or well water is simply impossible for washing purposes and rain water is hardly suitable for drinking. Heretofore, to have both hard and soft water on tap, two pumps were necessary or hand operated valves had to be opened and closed every time the other kind of water was wanted. There was only the choice between a double investment or an intolerable inconvenience.

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Plumbers in rural communities have an unparalleled opportunity to make a "killing" with this new, much needed device. The wise ones will get going now while the cream is still on. They will write us today for complete information.

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That seat could only be perfected by years of experience

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All Types of Floor and Ceiling Plates

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For Soil Pipe

No need to tear down and throw away a whole length of pipe just because there is a small hole in it. Slip on a Saaco Repair Plate and the job is good as new without any obstruction on the inside of the pipe.

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Crescent saddle pattern seat with hidden hinge. This seat is virtually wood concrete. It is impervious to moisture, fireproof, has no joints, and will not chip, crack or warp. Furnished also in closed front pattern, in mahogany or ebony finish.

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A Perfect Pipe Joint Compound

Holds the pressure yet does not harden

Is ready to use without mixing.
Is clean to handle.
Is non-poisonous.
Is more economical than lead.
Will hold over 500 lbs. pressure.
Will not harden in the joint or dry up.

Deegan's THREAD-JOINT SEAL

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Union Rubber Products Corp., New York City.
Wolverine Brass Works., Grand Rapids, Mich.
Woodward-Wanger Co., Philadelphia, Pa.

SAWS, HACK, ROTARY
Excelso Specialty Wks., Buffalo.
Hotstream Heater Co., Cleveland.
Riverside Boiler Wks., Cambridge, Mass.

SCREWS, SELF-TAPPING
Parker Supply Co., New York City.

SEATS, TOILET, BABY
Beneke & Kropf Mfg. Co., Chicago.
Coyne & Delany Co., Brooklyn.
Duplex Safety Seat Co., Rochester, N. Y.

SEATS, TOILET
Beneke & Kropf Mfg. Co., Chicago.
Brunswick - Balke - Collender Co., Chicago.
Coyne & Delany Co., Brooklyn.
Douglas Co., John, Cincinnati.
Duplex Safety Seat Co., Rochester, N. Y.
Hayes-Ruppel Mfg. Co., Grand Rapids, Mich.
Never Split Seat Co., Evansville, Ind.
Perfect Tank & Seat Co., Syracuse, N. Y.
Sanitary Specialties Co., Philadelphia.
Sherwood Brass Works, Detroit.
Standard Tank & Seat Co., Camden, N. J.
Wolff Mfg. Corp., Chicago.
Woodward-Wangor Co., Philadelphia.

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Duriron Co., Inc., Dayton, O.

SINKS, ENAMELED IRON
Crane Co., Chicago.
Jones Hollow Ware Co., Baltimore, Md.
Kohler Co., Kohler, Wis.
Standard San. Mfg. Co., Pittsburgh.
U. S. Sanitary Mfg. Co., Pittsburgh.
Wolff Mfg. Corp., Chicago.

SINKS, PORCELAIN
Crane Co., Chicago.
Wolff Mfg. Corp., Chicago.

SINKS, SLOP
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Kohler Co., Kohler, Wis.
Sanitary Company of America, Linfield, Pa.
Standard San. Mfg. Co., Pittsburgh.
U. S. Sanitary Mfg. Co., Pittsburgh.
Wolff Mfg. Corp., Chicago.

SINKS, STEEL
Koven & Bro., L. O., New York.

SINKS, VITREOUS CHINA
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Maddock's Sons Co., Thos., Trenton, N. J.
Standard San. Mfg. Co., Pittsburgh.
Trenton Potteries Co., Trenton, N. J.

SLEEVES, FLOOR AND CEILING
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.

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Raymond Lead Works, Chicago.

SOLDERING FLUXES
Benson Co., Inc., Alex. R., Hudson, N. Y.
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Kemoshyne Products, Inc., Camden, N. J.
Polygon Products Co., Boston.

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Chamberlain Co., Pittsburgh, Pa.
Hercules Chemical Co., New York.
Kemoshyne Products, Inc., Camden, N. J.

SPADES, BORING
Elermann Floor Scraper Co., Brooklyn.

STALLS, URINAL
Crane Co., Chicago.
Sanymetal Products Co., Cleveland.
Weis Mfg. Co., Henry, Atchison, Kan.

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Martin & Sons, H. P., Owensboro, Ky.
Standard Iron Works, New York.
Williams & Co., J. H., Brooklyn, N. Y.

STANDS, RANGE BOILER
Mechanicville Specialty Supply Mfg. Co., Mechanicville, N. Y.
Sanitary Company of America, Linfield, Pa.

STOCKS AND DIES
Armstrong Mfg. Co., Bridgeport, Conn.
Bignall & Keeler Mch. Works, Edwardsville, Ill.
Borden Co., Warren, O.
Crown Die & Tool Co., Chicago.
Greenfield Tap & Die Corp., Greenfield, Mass.
Nye Tool & Machine Works, Chicago.
Toledo Pipe Threading Machine Co., Toledo, Ohio.

SWITCHES, ELECTRIC, PRESSURE
Penn Electric Machine Co., Des Moines, Ia.

TANKS, CLOSET, COMPOSITION
Coyne & Delany Co., Brooklyn.
Hayes-Ruppel Mfg. Co., Grand Rapids, Mich.

TANKS, EXPANSION
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Koven & Bro., L. O., New York.
Novelty Steam Boiler Wks., Baltimore.
Penn Engineering Co., Philadelphia
Wheeling Steel Products Co., Wheeling, W. Va.

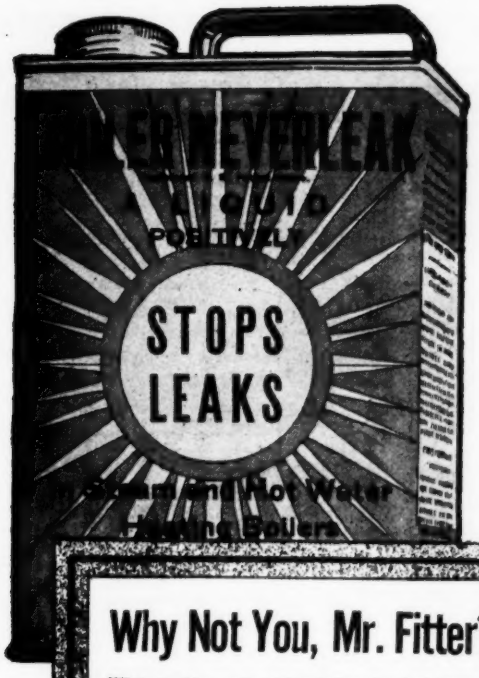
TANKS, PNEUMATIC
Hamburg Boiler Works, Hamburg, Pa.
Kewanee Boiler Co., Kewanee, Ill.
Leader-Trahern Co., Decatur, Ill.
Novelty Steam Boiler Wks., Baltimore.
Richmond Engineering Co., Richmond, Va.
Rider-Ericsson Engine Co., New York City.
Wilks Mfg. Co., S. Chicago.

TANKS, SEPTIC
Chemical Toilet Corp., Syracuse, N. Y.
Dickey Clay Mfg. Co., W. S., Kansas City, Mo.
Richmond Engineering Co., Richmond, Va.

TANKS, STORAGE, STEEL
General Boilers Co., Waukegan, Ill.
Gerstein Bros. & Cooper, S. Boston.
Hamburg Boiler Works, Hamburg, Pa.
Kewanee Boiler Co., Kewanee, Ill.
Keystone Boiler & Fdy. Co., Landisville, Pa.
Koven & Bro., L. O., New York.
Leader-Trahern Co., Decatur, Ill.
Novelty Steam Boiler Wks., Baltimore.
Richmond Engineering Co., Richmond, Va.
Wilks Mfg. Co., S., Chicago.

TANKS, WATER CLOSET, ENAMELED IRON
Crane Co., Chicago.
Jones Hollow Ware Co., Baltimore, Md.
Kohler Co., Kohler, Wis.
Standard San. Mfg. Co., Pittsburgh.
U. S. Sanitary Mfg. Co., Pittsburgh.

TANKS, WATER CLOSET, VITREOUS CHINA
Chicago Pottery Co., Chicago.
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Kalamazoo Sanitary Mfg. Co., Kalamazoo, Mich.
Maddock & Sons, John, Trenton.
Maddock's Sons Co., Thos., Trenton, N. J.
Standard San. Mfg. Co., Pittsburgh.
Trenton Potteries Co., Trenton, N. J.
Wolff Mfg. Corp., Chicago.
Zwermann Co., Robinson, Ill.



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Yet there's a plumber in Louisiana who saved his customer about $700.00 and made a net profit of $147.00 for himself by using Boiler Neverleak.

This is not an unusual case either—it's only one of hundreds of similar cases where plumbers and heating contractors are earning from $10.00 to $50.00 an hour repairing cracked hot-water and steam heating boilers of all types, with

BOILER NEVERLEAK

Backed by a Million Dollar Guarantee

Here's another Money Maker—

Just as a suggestion! There are hundreds of plumbers and fitters who are making splendid profits by opening clogged drains, simply by using

NEVERLEAK DRAIN SOLVENT

the most effective chemical for releasing stoppages in closets, urinals, traps or any waste or sewerage pipe systems.

Neverleak Drain Solvent is so powerful that you are sure of results.

It is backed unqualifiedly by the same liberal guarantee that is behind Boiler Neverleak.

Neverleak Drain Solvent is a profitable side line, too—to put on your shelves to sell to your customers. It comes in one and two-pound friction top cans that net you a splendid profit.

FREE REGULATOR CLOCK FREE

We will give to any fitter or plumber a regulator clock over three feet high, with an order for Boiler Neverleak. Write for conditions.

$1,000,000.00 GUARANTEE BEHIND EVERY SALE!

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353 Ellicott St.
BUFFALO, N. Y.

Who Pays for the Call Backs?

We'll suppose you have just installed a new closet combination. The tank trimmings were not just right—a small sand hole in the supply cock casting finally lets go. The customer stands for the annoying dribble of the overflow as long as he can—but finally it gets on his nerves and while in this cheerful frame of mind he calls on you to "fix" it, and do it quick.

You put in a new fitting, of course, but you can't charge for it. "But the manufacturer guarantees it and will replace it," you say. True, but he does not pay for your labor costs nor the time it took you to go out and return from the job. No two ways about it—you pay for the call backs and no one else.

The remedy is this—be sure your tanks are equipped with tested fittings. Every "Frost" ball cock is tested where it should be tested,—at the factory before shipment,—under a considerably higher pressure than it will ever be subjected to in service. A sand hole or other flaw, is instantly detected and the fitting thrown out. In this way, the use of Frost Tank Trimmings reduce your call-backs and increase your net profits and good will.

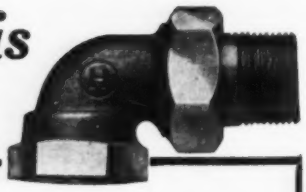
Ask your jobber

MEMBERS
THE NATIONAL
TRADE EXTENSION BUREAU
OF THE
PLUMBING AND HEATING INDUSTRY

Frost Manufacturing Co.

KENOSHA, WISCONSIN

Service is the Test



A radiator valve that stands up in service, year after year, must possess superior merit.

Hammond Radiator Valves

have made good over a long period of time. They are built right to stay tight.

We make a standard line of radiator valves for steam and water.

Your jobber can supply you

Hammond Brass Works
Hammond, Ind.

The Climax Cellar Drainer

Why use uncertain and costly waterproofing of cement, asphalt, tar, etc., when the CLIMAX Cellar Drainer is so positive, dependable and inexpensive? The CLIMAX is usually installed in the end, why try something else in the beginning?

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Deekum Building Portland, Ore.
Kerchoff Building, Los Angeles, Cal.
L. C. Smith Building, Seattle, Wash.

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THERMOSTATS
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Fulton Company, Knoxville, Tenn.
Hotstream Heater Co., Cleveland.
Minneapolis Heat Regulator Co., Minneapolis, Minn.
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TRAPS, ACID PROOF
Duriron Co., Inc., Dayton, O.

TRAPS, ANTI-SYPHON
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American Sanitary Mfg. Co., Abingdon, Ill.
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Eagle-Picher Lead Co., Cincinnati.
Frost Mfg. Co., Kenosha, Wis.
Raymond Lead Works, Chicago.
Rudolph Co., A. J., Philadelphia.
Sanitary Company of America, Linfield, Pa.
Wise, Inc., J. B., Watertown, N. Y.
Wolverine Brass Works, Grand Rapids, Mich.

TRAPS, BACK WATER
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Blake Specialty Co., Rock Island, Ill.
Compound Inj. & Specialty Co., Chicago.
Crampton-Farley Brass Co., Kansas City, Mo.
Illinois Malleable Iron Co., Chicago.
Wade Iron San. Mfg. Co., Chicago.

TRAPS, BRASS
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American Sanitary Mfg. Co., Abingdon, Ill.
Frost Mfg. Co., Kenosha, Wis.
Haydenville Co., Haydenville, Mass.
Wise, Inc., J. B., Watertown, N. Y.
Wolverine Brass Works, Grand Rapids, Mich.
Woodward-Wagner Co., Philadelphia.

TRAPS, CAST IRON
Blake Specialty Co., Rock Island, Ill.
Compound Inj. & Specialty Co., Chicago.
Riverside Fdry. & Galv. Co., Kalamazoo, Mich.
Sanitary Company of America, Linfield, Pa.

TRAPS, CATCH BASIN
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Illinois Malleable Iron Co., Chicago.
Wade Iron San. Mfg. Co., Chicago.

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Raymond Lead Works, Chicago.
Riverside Foundry & Galv. Co., Kalamazoo, Mich.
Sanitary Company of America, Linfield, Pa.
Wade Iron San. Mfg. Co., Chicago.

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Compound Inj. & Specialty Co., Chicago.
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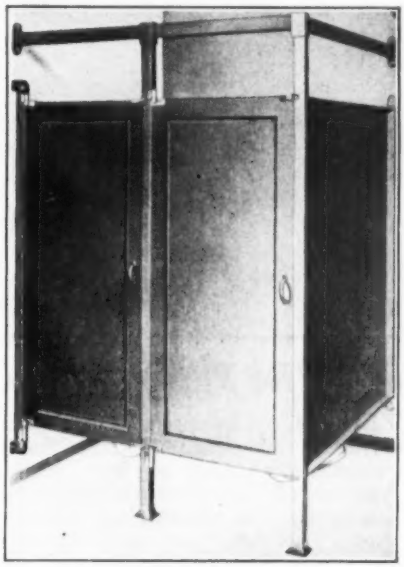

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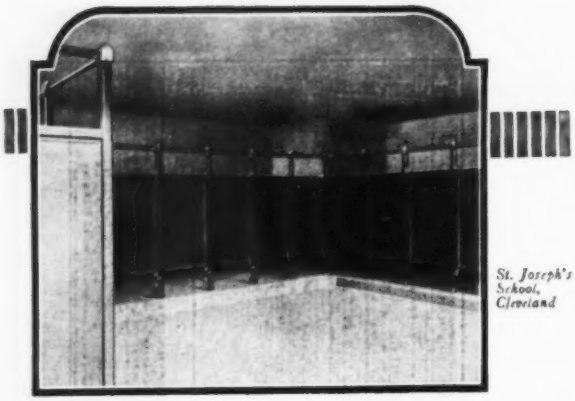

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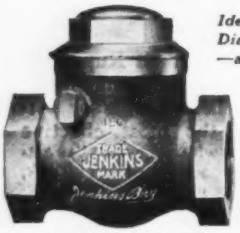

Fig. 352. Brass Swing Check Valve for either horizontal or vertical use

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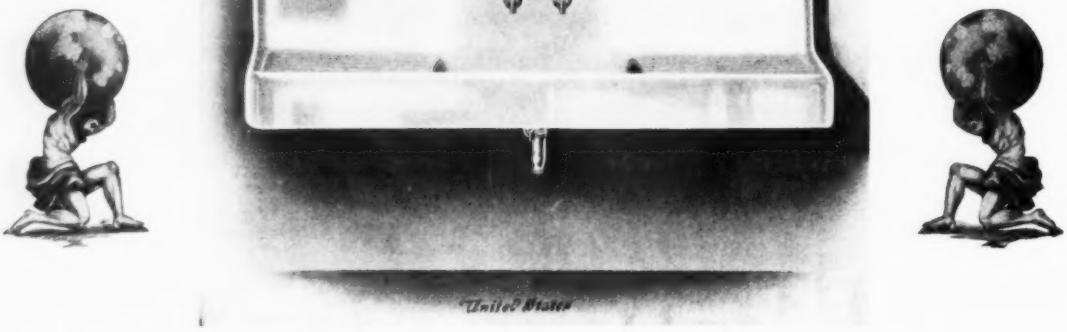

PLATE C-410

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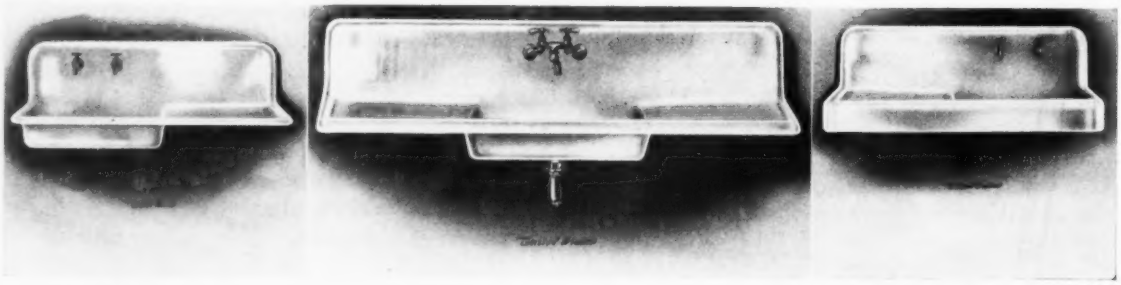

PLATE C-406
Left Hand Drain Board.

PLATE C-407
Right Hand Drain Board.

PLATE C-442
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